Proposal

RFP No. 2026-JAII-01

Request for Proposals for AI Hub Data Commons Collaborative Consulting Services

Submitted by:
22nd Century Technologies, Inc.
HQ:8251 Greensboro Drive, Suite 900, McLean, VA 22102
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SUBMITTED TO:
Massachusetts Technology Collaborative
75 North Drive
Westborough, MA 01581-3340
Procurement Team Leader: Sabrina Mansur
Responses Due: 10/7/2025

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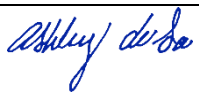
Local Office: 303 Congress ST., Boston, MA, 02210
Headquarters: 8251 Greensboro Drive, Suite 900, Mclean, VA, 22102

Application Cover Sheet (Attachment A)

Attachment A

Application Cover Sheet

Name of Respondent	22nd Century Technologies, Inc.		
Mailing Address: 8251 Greensboro Drive	City/Town McLean	State: Virginia	Zip Code 22102
Telephone (866) 537-9191 Ext 2	Fax 732-537-0888	Web Address www.tscti.com	
Primary Contact for Clarification: Ashley Christina De Sa		Primary Contact E-mail Address sledproposals@tscti.com	
Authorized Signatory 		Authorized Signatory E-mail Address sledproposals@tscti.com	
Legal Status/Jurisdiction (e.g., a Massachusetts Corporation, LLC, LLP, etc.) S-corporation		Respondent's W-9: W-9 Form Attached below Respondent's UEI No. QT2VZ9L1VPQ1	

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Firm' Introduction and Qualification

- ***A description of the firm responding to the RFP (including descriptions of proposed subcontractors, if any) and the firm's qualifications to perform the services.***

22nd Century Technologies, Inc. (hereafter referred to as "TSCTI") is pleased to submit this proposal to Massachusetts Technology Collaborative ("MassTech")/Data Commons Collaborative (DCC) for AI Hub Data Commons Collaborative Consulting Services. Incorporated in 1997 as an S-Corporation, TSCTI is a mature IT consulting services company, ***appraised at CMMI Level 3, and certified as CMMI 2.2 Dev, CMMC, ISO 9001:2015, ISO 20000-1:2018, and ISO 27001:2013*** with over 28 years of experience providing similar services to various government agencies. We help government agencies leverage cutting-edge AI, generative AI, machine learning, and natural language processing technologies to increase operational efficiency, make deeper data-driven decisions, and reduce human errors. We work with federal, state, and local government agencies to bring their AI vision to fruition. Our AI Lab explores the application of artificial intelligence and machine learning to bring time and cost savings to government agencies. TSCTI's AI solutions have supported agencies in transforming service delivery, optimizing operations, and improving constituent outcomes. ***Key strengths include:***

Why Choose TSCTI?

- ✓ 28+ years at the forefront of Data Science and AI.
- ✓ AI consultants and developers with 7–20+ years of relevant experience and competencies in major AI/ML technologies, frameworks, and libraries.
- ✓ Deep expertise in AI-associated services: since 2005 in business intelligence and data warehousing, since 2013 in big data and image analysis.
- ✓ Long-standing partners of Microsoft and AWS
- ✓ Domain experience in 30+ industries, including financial services, healthcare, manufacturing, retail, telecoms.
- ✓ Expertise in industry-specific standards (HIPAA, GAMP, PCI DSS, GLBA, etc.) to create compliant AI solutions.
- ✓ ISO 9001 and ISO 27001-certified to ensure high quality of AI services and full security of the customers' data.
- ✓ DevSecOPS approach to create a strongly protected environment for data processing and storage.
- ✓ TSCTI offers: Best-in-class NLU, Intent detection, large language models, Unsupervised learning, Advanced analytics, AI-powered agent assist, Easy integration with existing systems, Consulting services, and more.

- ➢ *03 Decades of experience supporting complex government programs across health, human services, transportation, housing, and public safety.*
- ➢ *From AI readiness assessments and strategy design to development, deployment, and ongoing monitoring.*
- ➢ *Deep expertise in FedRAMP, HIPAA, CJIS, NIST, ADA, and OWASP standards to safeguard sensitive government data.*
- ➢ *Focus on bias mitigation, demographic fairness analysis, and transparency in model design and deployment.*
- ➢ *Ability to deliver enterprise-scale platforms (AI Tools as a Service) or fully customized AI solutions tailored to departmental needs.*

Our D&B Customer Satisfaction Open Rating Score of 93 attests to our success in delivering IT consulting services to over 400+ government and private sector clients, including numerous healthcare and educational institutions. TSCTI's commitment to excellence has earned us numerous accolades, including recognition as one of *the Best Employers for Tech Workers*. Also, we were recognized as one of the "*Most Promising Managed IT Service Providers" and the "Best Government Contracting Company of the Year*" in the category of $50M+ at the ICON awards hosted by the *Maryland Tech Council. TSCTI's global reach was exemplified as it clinched victory in the Global Pitch competition at TiECon Silicon Valley and* received the prestigious "*Jewels of Asia Power 30 Award" in the $100+ million award category by the Asian American Chamber of Commerce. We are a Microsoft Gold Partner and an Oracle Gold Partner and have developed strategic partnerships with AWS, Microsoft, Oracle, Splunk, VMware, Red Hat & SolarWinds. Additionally, we rank among the top 100 companies in New Jersey and hold the 3rd position in the NJ Fast 50.* These achievements underscore our dedication to delivering exceptional services and the expertise of our staff.

We started our journey with 200 employees, and today we stand strong with ***6500+ full-time equivalent employees (FTEs).*** TSCTI stands as a sizable, privately held company. Our robust workforce enables us to effectively tackle a wide range of projects and provide comprehensive solutions to our clients. The depth and breadth of our team allow us to manage complex IT initiatives, ensuring that we have the expertise and resources to deliver exceptional services and meet the evolving needs of our clients. Our values are built on a tradition of integrity, quality, and service excellence—keys to the longstanding relationships we create with customers, employees, and suppliers. As our name implies, we are a forward-thinking company with the ultimate goal of helping our customers implement innovative solutions that will satisfy their business needs. ***Below, we have demonstrated our awards for being an IT service provider.***

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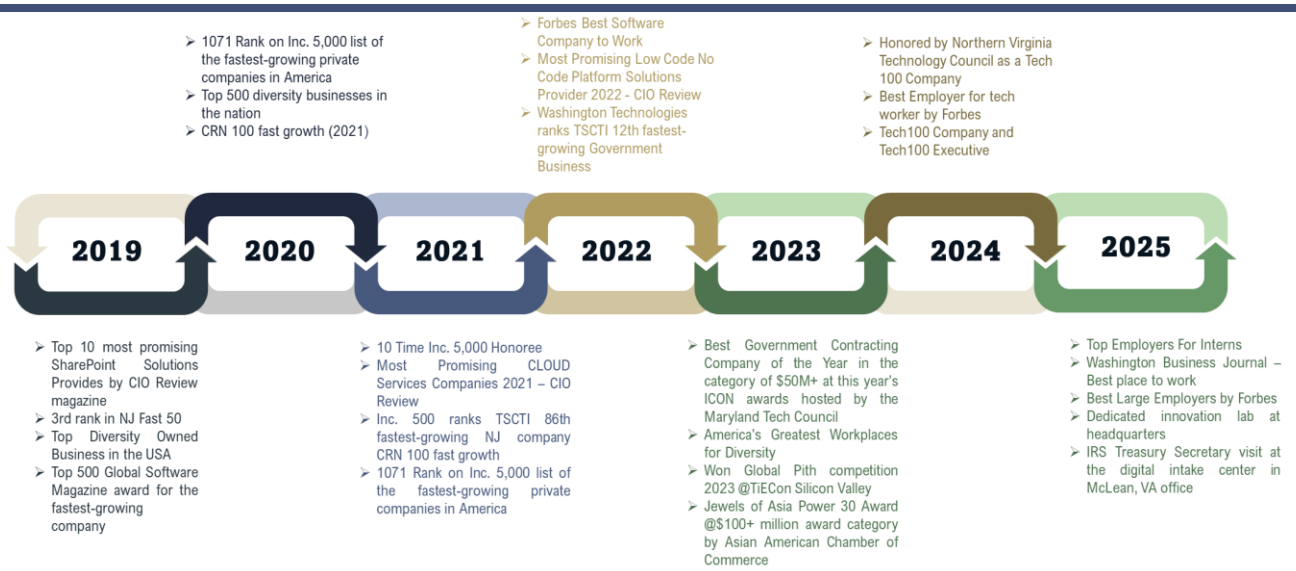
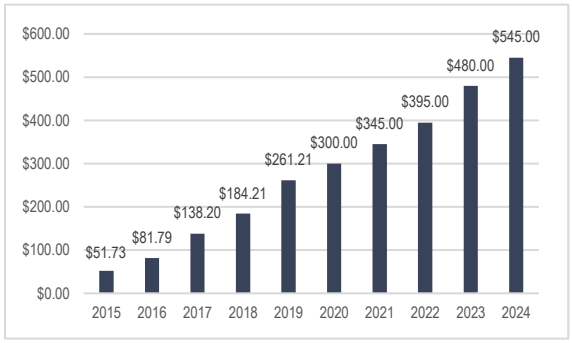
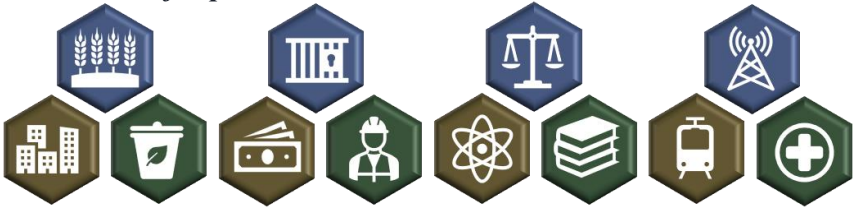

2019
2020
2021
2022
2023
2024
2025
Top 10 most promising SharePoint Solutions Provides by CIO Review magazine
3rd rank in NJ Fast 50
Top Diversity Owned Business in the USA
Top 500 Global Software Magazine award for the fastest-growing company
1071 Rank on Inc. 5,000 list of the fastest-growing private companies in America
Top 500 diversity businesses in the nation
CRN 100 fast growth (2021)
10 Time Inc. 5,000 Honoree
Most Promising CLOUD Services Companies 2021 – CIO Review
Inc. 500 ranks TSCTI 86th fastest-growing NJ company CRN 100 fast growth
1071 Rank on Inc. 5,000 list of the fastest-growing private companies in America
Forbes Best Software Company to Work
Most Promising Low Code No Code Platform Solutions Provider 2022 - CIO Review
Washington Technologies ranks TSCTI 12th fastest-growing Government Business
Best Government Contracting Company of the Year in the category of $50M+ at this year's ICON awards hosted by the Maryland Tech Council
America's Greatest Workplaces for Diversity
Won Global Pith competition 2023 @TiECon Silicon Valley
Jewels of Asia Power 30 Award @$100+ million award category by Asian American Chamber of Commerce
Honored by Northern Virginia Technology Council as a Tech 100 Company
Best Employer for tech worker by Forbes
Tech100 Company and Tech100 Executive
Top Employers For Interns
Washington Business Journal – Best place to work
Best Large Employers by Forbes
Dedicated innovation lab at headquarters
IRS Treasury Secretary visit at the digital intake center in McLean, VA office

Financially, we manage an annual contract portfolio exceeding *$500 million in value*, covering multi-year IDIQs, BPAs, and GWAC vehicles with agencies such as the Department of Defense, Department of Homeland Security, Department of Health and Human Services, and multiple state health and transportation departments. *In 2024, our company was valued at an impressive $545 million, reflecting our consistent expansion and success.* Our solid financial standing ensures our ability to invest in innovative technologies, recruit top talent, and maintain the resources required to meet MassTech/DCC's needs. ***The graph demonstrates our financial growth in the past years.***



Commitment to Innovation: Our core values center around innovation, collaboration, and a relentless drive for excellence, which collectively create an environment where creativity and technical expertise thrive. Adhering to industry best practices, including the Digital Services Playbook and Section 508 compliance, we ensure our solutions are inclusive and accessible. We allocate approximately 19% of our total annual revenue to research and development initiatives. This investment underscores our dedication to staying at the forefront of technological advances and industry trends, ensuring that our solutions are innovative, efficient, and aligned with the evolving needs of our clients by leveraging industry analyses from Gartner and Forrester. To support our customers with better solutions, TSCTI has established a Center of Excellence (CoE) & Digital Intake Center at our McLean, VA office, which is led by our CTO and CGO. *The image represents our CEO, Anil Sharma, hosting Treasury Secretary Janet Yellen and IRS Commissioner Danny Werfel at the Digital Intake Center in McLean, VA, for a digital showcase that underscores the national commitment to modernizing government operations.* This office supports all the clients with *a) white papers on new trends, b) solution prototyping with integration with new tools and c) SME support for the assessment of our customer services d) providing an excellent source for the latest technical know-how for employees at client sites.*

We offer a range of services in artificial intelligence consulting tailored to clients' needs. Our AI service offers support to the full range of government domains to ensure adoption, understanding, and mission utility. We create efficiency and insight advantage through standardized technical stacks (integrated hardware and software for rapid access to production-grade AI) and services that deliver accelerated pathways to AI impact. Our suite of strategy, design, architecture, data, systems integration, program operations, and risk services is combined with our deep domain and sector knowledge. The ***mentioned graphic demonstrates relevant areas of expertise:***



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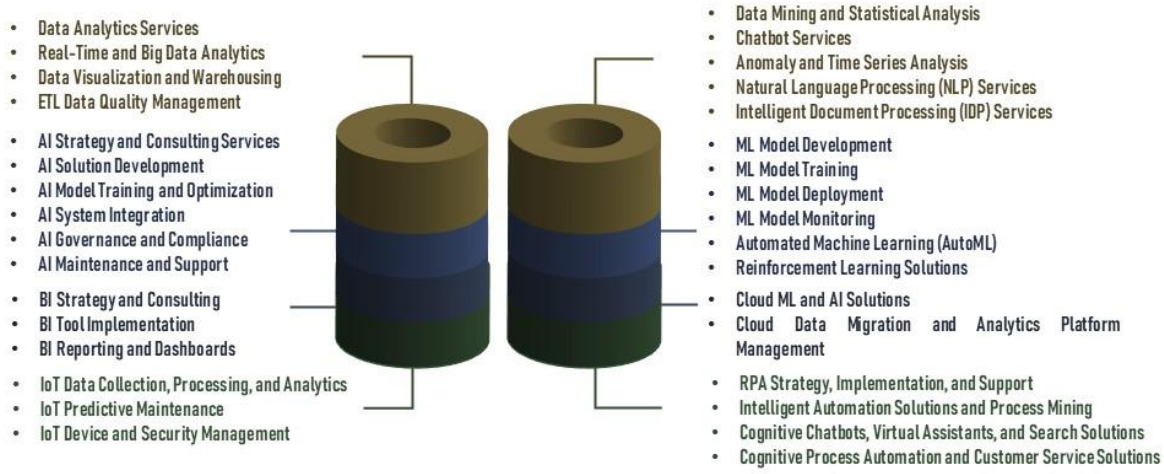
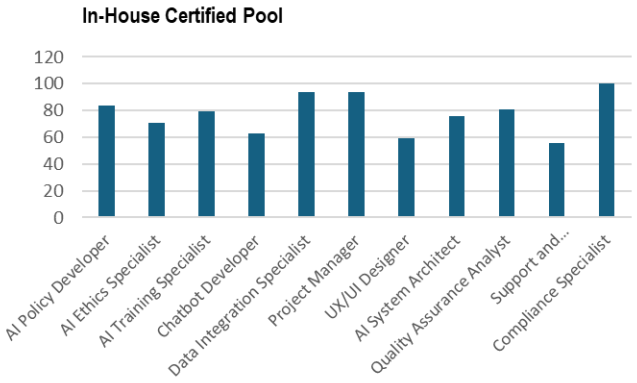
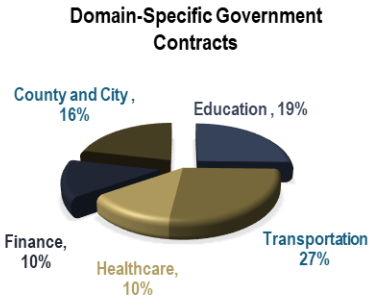

Data Analytics Services
Real-Time and Big Data Analytics
Data Visualization and Warehousing
ETL Data Quality Management
AI Strategy and Consulting Services
AI Solution Development
AI Model Training and Optimization
AI System Integration
AI Governance and Compliance
AI Maintenance and Support
BI Strategy and Consulting
BI Tool Implementation
BI Reporting and Dashboards
IoT Data Collection, Processing, and Analytics
IoT Predictive Maintenance
IoT Device and Security Management
Data Mining and Statistical Analysis
Chatbot Services
Anomaly and Time Series Analysis
Natural Language Processing (NLP) Services
Intelligent Document Processing (IDP) Services
ML Model Development
ML Model Training
ML Model Deployment
ML Model Monitoring
Automated Machine Learning (AutoML)
Reinforcement Learning Solutions
Cloud ML and AI Solutions
Cloud Data Migration and Analytics Platform Management
RPA Strategy, Implementation, and Support
Intelligent Automation Solutions and Process Mining
Cognitive Chatbots, Virtual Assistants, and Search Solutions
Cognitive Process Automation and Customer Service Solutions

With over 6500 full-time employees deployed nationwide, TSCTI supports 400+ active government contracts, including 40+ technology departments. TSCTI has been consistently recognized as one of the Top 100 Tech Companies and is ranked among the Top 25 fastest-growing private companies in the IT services sector. *Our workforce includes 600+ certified AI and data analytics professionals, 400+ cybersecurity experts (CISSP, CISM, CEH, Security+), 700+ cloud-certified engineers (Azure, AWS, Google Cloud), and 400+ PMP/ITIL-certified project managers. This depth of technical expertise enables us to deliver both enterprise-scale programs and specialized consulting engagements with agility and precision. TSCTI's strong national delivery capability is further evidenced by our support of 24x7 operations for over 50 government clients, operation of multiple Security Operations Centers (SOCs), and hosting of FedRAMP-compliant and CJIS-aligned cloud environments*. We have successfully delivered AI-enabled platforms impacting millions of residents, including predictive analytics for public health, automated eligibility systems for human services, and AI-driven traffic forecasting tools for smart transportation programs.





By integrating innovations such as artificial intelligence, machine learning, and blockchain into our services, we provide our clients with high-tech solutions that give them a competitive edge. Our CoE serves as the hub of technical expertise, knowledge, and support that drives our solutions forward. Our services span the full spectrum of IT, including AI, business process optimization, and IT infrastructure assessments. Backed by our Center of Excellence (CoE) and iHub, we consistently deliver innovative solutions tailored to meet the unique needs of our clients. With a D&B customer satisfaction rating of 95%, TSCTI is dedicated to excellence, ensuring that 97% of our projects receive Very Good or Exceptional ratings.

28+
Years of Experience

1500+
FTEs across geographies with similar experience and skill sets

100%
Data Security

99.7%
Accuracy Achieved

24*7
Availability

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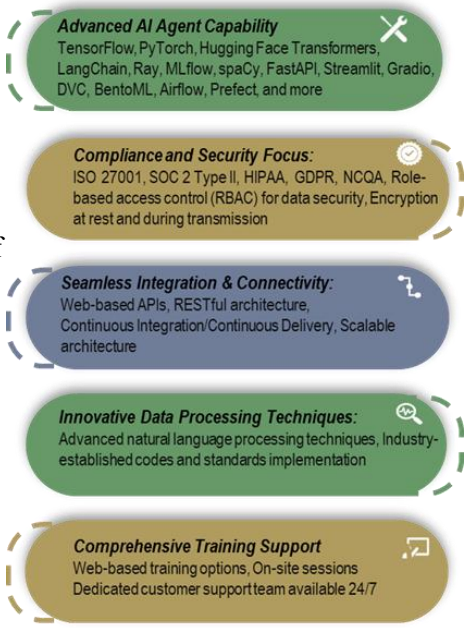
Demonstrated technical expertise and platform delivery experience


Advanced AI Agent Capability
TensorFlow, PyTorch, Hugging Face Transformers, LangChain, Ray, MLflow, spaCy, FastAPI, Streamlit, Gradio, DVC, BentoML, Airflow, Prefect, and more
Compliance and Security Focus:
ISO 27001, SOC 2 Type II, HIPAA, GDPR, NCQA, Role-based access control (RBAC) for data security, Encryption at rest and during transmission
Seamless Integration & Connectivity:
Web-based APIs, RESTful architecture, Continuous Integration/Continuous Delivery, Scalable architecture
Innovative Data Processing Techniques:
Advanced natural language processing techniques, Industry-established codes and standards implementation
Comprehensive Training Support
Web-based training options, On-site sessions
Dedicated customer support team available 24/7

TSCTI brings a proven record of architecting and delivering secure, scalable, and mission-critical data platforms for government and enterprise clients. As a Microsoft Gold Partner, our expertise spans cloud-native architectures, data integration pipelines, synthetic data generation, and AI/ML-driven analytics—all of which directly align with the Massachusetts AI Hub Data Commons Collaborative (DCC) requirements. Our AI Center of Excellence (CoE), where we create, develop, and improve solutions specifically suited to the demands of government organizations, is at the core of TSCTI's innovation. Our data scientists, engineers, and domain specialists have developed each AI platform internally, giving us complete control over scalability, security, and compliance. Our AI Solutions as a Service, in contrast to off-the-shelf offerings, are specifically designed for the public sector, using years of expertise with the justice, transportation, health, and education sectors. The end product is a portfolio of tried-and-true AI platforms that blend state-of-the-art technology with the dependability, accountability, and openness that local governments want. ***Key productized services we have delivered to government clients include:***

- ***1City App (G-BOT—AI Virtual Assistant):*** An AI-powered resident engagement solution providing next-gen 311 services, event listings in the community, 2-way smart messaging, utility payments, and connecting city administration with all the residents through an agentic AI approach. 1City has a unique G-bot deployed to enhance residents' engagement by providing multilingual, 24/7 support for non-emergency inquiries, ticket status navigation, and constituent services. This solution also provides the administrative agency with a role-specific intelligent dashboard that presents a 360-degree view of data analytics performed using the latest AI models, such as classifiers, YOLO, R-CNN, semantic analysis, and sentiment analysis as well.

Client: City of Elkins, West Virginia.

- ***Calls.Care (AI-Enabled Call Center Platform):*** An intelligent call center solution that augments state representatives with AI-driven automation for scheduling, verification, onboarding, and reminders. This solution presents a new-age experience for the agencies and their users. It is a cloud-agnostic solution that has a built-in user-view AI bot and agent-view bot, both running in parallel to facilitate seamless functioning, thereby reducing the wait times. The agent view AI bot has a multilingual speech capturing capability to present the relevant data or information on the agent's screen, which in turn aids the agent in presenting the right information in the minimum possible time to the user, ensuring that language barriers do not hinder constituent engagement and access to vital services.

Clients: Illinois Secretary of State (ILSOS), Minnesota Department of Health, U.S. Office of Personnel Management (OPM).

- ***XtractIQ (Intelligent Document Processing Platform):*** A secure and compliant AI/NLP-driven platform for document capture, classification, and data extraction, enabling automated document workflows across sensitive government operations. By leveraging machine learning, XtractIQ reduces manual workload, ensures accuracy, and enforces strong compliance with federal data standards. XtractIQ is rapidly making inroads into various departments because of its completely customizable features. Wherever there is a huge pile of physical documents, XtractIQ is championing the transformation of these documents into meaningful information. Use cases, in addition to IRS, include health and human services, education, taxation, and transportation etc.

Client: Internal Revenue Service (IRS).

- ***Workerra (Intelligent Workforce Management System):*** An advanced workflow and shift management system designed for environments where mission-critical staffing is required. This solution utilizes intelligent matching of resources to the shifts, releasing real-time notifications, job postings, acceptance, time sheet handling, billing, and invoice generation all in one. This solution was launched recently and has been widely applauded by the customer.

Client: University of Texas, Austin.

Familiarity with metadata standards, synthetic data, and AI fairness tools

TSCTI brings a proven record of architecting and delivering secure, scalable, and mission-critical data platforms for government and enterprise clients. As a Microsoft Gold Partner, AWS Advanced Consulting Partner, and Google Cloud Partner, our expertise spans cloud-native architectures, high-performance data integration pipelines, synthetic data generation, and AI/ML-driven analytics—all directly aligned with the Massachusetts AI Hub DCC requirements.

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At the heart of TSCTI's technical expertise is a deep understanding of what it takes to build a trusted, FAIR-aligned data ecosystem. We know that the DCC is not just about storing datasets—it is about creating an environment where data can be found, understood, validated, and responsibly used by researchers, agencies, and innovators alike. As we have worked with ***similar architecture and technologies while working for some of our prestigious clients, including but not limited to the US Department of Agriculture and the Department of Labor.*** To support this vision, TSCTI has mastered the discipline of metadata management and cataloging. We combine FAIR principles (Findable, Accessible, Interoperable, Reusable) with globally recognized metadata standards such as DCAT, Dublin Core, ISO 19115 for geospatial data, and Schema.org for dataset discoverability. This approach ensures that whether a dataset originates from MassGIS, the Department of Public Health, or an academic consortium, it is enriched with consistent metadata, traceable lineage, and version control, making the catalog not just a repository but a living, navigable knowledge system.

TSCTI brings advanced expertise in synthetic data generation, using tools such as SDV, Synthea, Gretel.ai, and CARLA. But we don't stop at generation: our teams employ rigorous validation practices—including distribution similarity metrics like the Kolmogorov–Smirnov test, Wasserstein distance analysis, and privacy risk scoring—to ensure that synthetic datasets faithfully represent real-world patterns while safeguarding sensitive information. By embedding these practices into our workflow, we align with NIST Differential Privacy guidelines and enable Massachusetts to foster innovation without compromising trust. As AI systems increasingly shape decisions, the DCC must provide the tools to detect, explain, and mitigate bias. TSCTI has built solutions using AIF360, Fairlearn, SHAP, and LIME, integrated into interactive dashboards that track bias drift and guide corrective actions. More importantly, our practices are anchored in global standards—from the NIST AI Risk Management Framework to ISO/IEC TR 24028 on AI trustworthiness and IEEE P7003 on algorithmic bias. This ensures that fairness is not treated as an afterthought but as a governing principle of responsible AI development within the DCC.

Additionally, TSCTI brings certified expertise across Azure, AWS, and Google Cloud, reinforced by CISSP-certified security architects. Our architectures embed role-based access controls, MFA, AES-256 encryption, SIEM monitoring, and immutable audit logs, delivering compliance with HIPAA, GDPR, and FedRAMP. These capabilities allow us to support tens of thousands of users, petabyte-scale datasets, and high-performance analytics workloads without compromising on security or user experience. ***TSCTI's technical capabilities extend across the full scope of the DCC Requirements, including:***

DCC Requirement Area	TSCTI Expertise/Capability	Client
Data Catalog & Metadata Management	Delivered FAIR-compliant catalogs using CKAN, Dataverse, DataHub, and Amundsen. Supported 25,000+ datasets across healthcare and finance. Implemented schema harmonization, dataset versioning, and lineage tracking. Aligned with DCAT, Dublin Core, ISO 19115 (geospatial), and Schema.org standards for interoperability and discoverability. The team includes 10+ Azure Data Engineers (certified).	Internal Revenue Service, State of Minnesota, City of New Orleans
Dataset Curation & Integration	Built ingestion pipelines using Apache NiFi, Airflow, and Azure Data Factory to integrate 50+ heterogeneous sources (CSV, APIs, IoT, GIS). Automated data quality checks, validation, and enrichment. Achieved 40% faster onboarding. Designed with ISO/IEC 11179 metadata registry practices for consistency.	Office of Personnel Management, Louisiana Department of Education
Synthetic Data Tools & Validation	Expertise with SDV, Synthea, Gretel.ai, and CARLA. Delivered 2M+ de-identified patient records for a state healthcare agency. Applied the Kolmogorov–Smirnov test, Wasserstein distance, and privacy risk scoring to validate synthetic fidelity and compliance. Designed with NIST Differential Privacy guidelines to ensure safe data sharing.	Internal Revenue Service, State of Minnesota, City of Dallas, City of Elkins
AI Fairness & Bias Framework	Implemented AIF360, Fairlearn, SHAP, and LIME. Built fairness dashboards with bias drift detection, mitigation workflows, and transparency reporting. Anchored in the NIST AI Risk Management Framework, ISO/IEC TR 24028 (AI trustworthiness), and IEEE P7003 (algorithmic bias) standards. Staff includes certified AI/ML specialists.	State of Arizona, Georgia Technical Authority, State of IL, CMHA
Security & Governance	Delivered HIPAA, GDPR, and FedRAMP-compliant systems. Implemented RBAC, MFA, AES-256 encryption, SIEM integration (Splunk/ELK), IDS/IPS, and immutable audit logs. The security team includes 5 CISSP-certified architects. Past projects passed 100% of state security audits.	University of North Texas System, City of Dallas, GTRI, EDLINK
Commons Credits System	Designed ledger-based tokenized credit systems using PostgreSQL, Hyperledger, and smart contracts. Supported 500K+ annual transactions across research consortia. Dashboards enabled transparent issuance, redemption, and incentives. Built for auditability and scalability to encourage sustained platform adoption.	Louisiana department of education

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Collaboration & Community Engagement	Developed dataset submission portals, annotation tools, and peer review workflows used by universities and research labs. Engagement dashboards achieved 90%+ adoption rates. Designed to support open innovation challenges and classroom integrations (K–12 to higher ed).	Louisiana Department of Education, University of Texas
Identity & Role-Based Access	Implemented federated identity (SAML, OAuth2, and OpenID Connect) across 5 statewide systems. Integrated with Azure AD B2C. Supported 20,000+ active accounts with a tiered dataset and field-level permissions. Designed with Zero Trust principles.	University of North Texas System, City of Dallas, PANYNJ, City of Elkins
Scalability & Performance	Architected data platforms handling 50TB+ lakes and 10,000+ concurrent users with <2s query times. Deployed on Azure Synapse, AWS Redshift, and BigQuery with auto-scaling pipelines. Benchmarked for petabyte-scale growth.	City of Elkins, University of North Texas System, Internal Revenue Service
Integration with State Data Portals	Implemented the integration of CapMetro card services with the Texas State Data Portals, enabling seamless automation of state card issuance. This solution streamlines the end-to-end process by validating applicant data directly through state systems, eliminating manual intervention, reducing processing errors, and ensuring faster card activation for eligible users	Capital Metropolitan Transportation Authority, TX
Provenance & Version Control	Implemented dataset lineage and version control with Apache Atlas and GitOps practices. Provided provenance dashboards for 200+ regulated datasets. Ensured compliance with FAIR reproducibility standards.	Louisiana Department of Education - EDLINK
User Training & Adoption	Delivered training programs through LMS, webinars, and hands-on labs. Trained 2,500+ state users with adoption kits. Achieved 92% active use in year one. Training aligned with ISO 10015 quality guidelines.	Internal Revenue Service, State of Minnesota, City of New Orleans, Office of Personnel Management, EDLINK
Governance & Policy Framework	Authored AI ethics and usage policies for state healthcare and education agencies. Facilitated cross-agency governance boards. Based on ISO/IEC 38505-1:2021 Data Governance and OECD AI Principles.	Minnesota Department of Health, University of Texas
Testing, QA, and Documentation	Built automated QA pipelines using PyTest, Selenium, and JMeter. Delivered API docs, admin playbooks, and compliance manuals. Past statewide projects launched with a 99% defect-free rate. Applied ISTQB testing standards.	Internal Revenue Service, State of Minnesota, City of New Orleans, Office of Personnel Management, EDLINK
Reporting & Dashboards	Developed dashboards in Power BI, Tableau, and Apache Superset. Provided role-based KPIs for policymakers, researchers, and administrators. Included views for dataset usage, bias/fairness metrics, and Commons Credits balances.	Internal Revenue Service, State of Minnesota, City of New Orleans, Office of Personnel Management, EDLINK
Sustainability & Extensibility	Architected modular platforms supporting blockchain-based audit trails, cross-state integration, and federal dataset linkage (NIH, DOT). Deployed CI/CD pipelines (Azure DevOps, GitHub Actions) to reduce release cycles by 45%. Designed for cloud portability and open standards.	Internal Revenue Service, State of Minnesota, EDLINK

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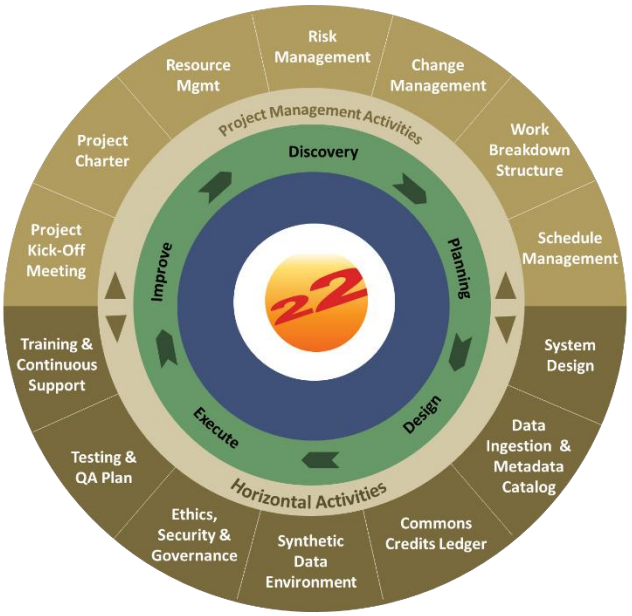
Proposed Approach

- ***The proposed approach to providing the Services. Additionally, respondents are invited to propose alternative(s) that provide substantially better or more cost-effective performance than achievable under the stated RFP scope of services.***

Project plan and high-level architecture approach



TSCTI recognizes the critical importance of effective program management, as the success of most programs hinges on it. Our leadership brings over 28 years of experience in delivering AI projects to many state and federal agencies, such as the USAID, OPM, State of Massachusetts, City of Dallas, City of New Orleans, State of Louisiana, and others. Our management methodology (shown in the figure on the right) is tailored according to programs that establish and maintain standardized program controls and incorporate qualified personnel, performance tools, and technology, and certified processes based on industry standards (i.e., PMI's PMBoK, ISO, ITIL, CMMI, and Six Sigma). Our all-encompassing program management approach is designed to facilitate requirements/activities through tailored and adaptable program lifecycle phases consisting of planning, design, execution, improvement, and discovery. For each program, our qualified program managers create and maintain a Work Breakdown Structure (WBS) and Integrated Master Schedule (IMS) in Microsoft (MS) Project, SharePoint Online, and other tools during planning for an accurate work breakdown, resource allocation, standardized controls, schedules, estimates, resource plans, performance reporting, monitoring, and ensuring milestones are accomplished on time, within cost, and within scope requirements. We establish dependencies between related project schedules through actively communicating with applicable stakeholders and leveraging our expert knowledge and report any potential impacts to ensure accurate schedules and metrics are provided to government managers. Our program managers will support scheduling meetings and other things as appropriate.

The program requirements will be aligned with KPI(s) of time/schedules, cost, scope, and quality, which are key in maintaining and improving program performance standards and output. These control indicators provide a basis to assure resources, services, and efforts are properly planned, controlled, tracked, and reported on, and managed on time, on budget, with optimal levels of quality, performance, and compliance according to program requirements and performance objectives established. While requirements, tasks, and/or programs move through the execution, monitoring & controlling phases, we provide transparent reporting based on qualitative and quantitative data communicated regularly through our defined chain of command. TSCTI provides procedural and process support for security, operations, administration, logistics, budget, communications, and training as shown in our Program Management Support Model. TSCTI will be responsible for the collection of information on program progress, risk analysis, and impacts, and ensure that the program plan and delivery progress match with government expectations. We bring any actual or potential schedule delays and problems pertaining to the assigned program to the attention of the government proactively to work toward immediate resolution. We leverage our project management methodologies to produce measurable and actionable outcomes to get the work done using program management disciplines. Our program managers schedule program management reviews (PMRs) with government managers that summarize the information required in the progress reports, including work performed, type and amount of effort, earned value, cost and schedule analyses, expenses incurred, deliverables completed, work in progress, percentage of annual effort expended, problems encountered, recommended solutions, and work planned for the next reporting period. We ensure the performance of all contracts' administrative management functions.

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Below, we have detailed our approach to providing the requested services in phases:

Phase 1: Initiation & Design

- ***Stage 1 – Initiation & Planning***

With decades of experience delivering statewide data initiatives, TSCTI recognizes that lasting success begins with structured governance, stakeholder alignment, and transparent planning. In this Stage, we will formally establish the foundation of the Commons, ensuring that the program proceeds with a clearly defined vision, validated roadmap, and shared accountability across all participants.

This Stage commences with a program initiation workshop, convening representatives from government agencies, academic institutions, research organizations, and community partners. The objective of this session is to achieve consensus on program objectives, confirm stakeholder roles and responsibilities, and establish communication protocols for program execution. Facilitated by TSCTI's Program Management Office, this workshop also documents potential risks, dependencies, and success criteria, providing a structured baseline for subsequent delivery. Parallel to stakeholder alignment, TSCTI will formalize the governance framework. This includes the establishment of a multi-stakeholder governance board, the definition of decision-making workflows, and the codification of escalation and approval procedures. Policies governing data contribution, usage, and access will be articulated to provide clarity and accountability. This framework ensures that decision-making authority is distributed transparently and that governance remains consistent with the principles of security, compliance, and ethical data stewardship.

A critical outcome of this Stage is the definition of dataset inclusion criteria. TSCTI will collaborate with domain experts and data stewards to establish rigorous standards addressing relevance, accuracy, completeness, compliance, and ethical considerations. These criteria will guide the onboarding process and ensure that datasets incorporated into the Commons are of demonstrable value and integrity. Once the criteria are established, TSCTI will coordinate with stakeholders to develop and validate the initial dataset inventory. This inventory will include datasets prioritized by strategic importance to Massachusetts, with clear classification by domain, access tier (public, restricted, or federated), and metadata attributes. The inventory provides a structured foundation for Stage 3 (ingestion and cataloging) and ensures that the Commons launches with a representative and high-impact dataset portfolio.

The outputs of Stage 1 will be consolidated into a comprehensive project plan, which will define delivery milestones, governance checkpoints, risk registers, and resource allocations. This plan will undergo formal review and approval by the governance board, providing a definitive baseline against which all subsequent activities will be managed. ***Deliverables:***

- ✓ Kickoff Workshop Report – objectives, stakeholder roles, success criteria, communication protocols
- ✓ Governance Charter – governance board composition, decision-making workflows, policies, escalation procedures
- ✓ Dataset Inclusion Framework—standards for dataset selection and onboarding
- ✓ Initial Dataset Inventory—a prioritized, categorized list of datasets with metadata and access tiers
- ✓ Comprehensive Project Plan – milestones, governance checkpoints, risk register, resourcing plan

- ***Stage 2 – Infrastructure Setup & Architecture:***

As a Microsoft Gold Partner and AWS Advanced Consulting Partner, TSCTI brings certified cloud architects skilled in building secure, scalable, and resilient infrastructures for public-sector data platforms. In Stage 2, we will design, provision, and validate the technical architecture of the Commons to enable multi-agency collaboration, long-term sustainability, and high-performance analytics.

The initial activity in this Stage is to provision the cloud environment. Based on stakeholder preferences and existing state investments, TSCTI will install the platform on an enterprise-grade cloud environment (Azure, AWS, or Google Cloud) in accordance with state-level compliance standards. Our certified cloud architects will configure high-availability clusters, fault-tolerant storage, and auto-scaling compute resources to ensure that the Commons can accommodate both current workloads and future expansion. Concurrently, TSCTI will implement a multi-tiered identity and access management framework. This will include single sign-on (SSO), multi-factor authentication (MFA), and role-based access controls (RBAC) aligned with state cybersecurity policies. The framework will distinguish between public users, approved researchers, administrators, and governance board members, providing differentiated access to datasets and tools. Integration with state identity providers (e.g., Azure AD or existing state directory services) will ensure seamless onboarding for agency personnel and external collaborators.

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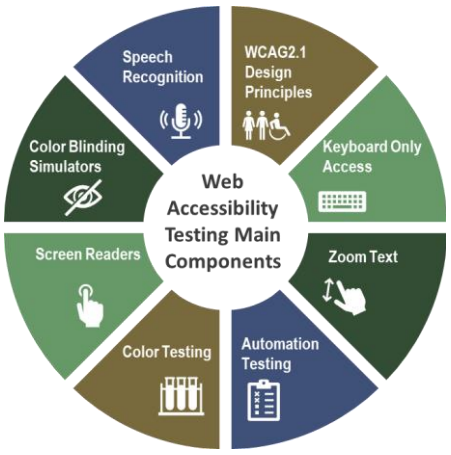
With the infrastructure in place, TSCTI will establish the development, testing, and production environments. Each environment will be isolated and governed by DevSecOps pipelines that enforce automated testing, security scanning, and compliance validation before deployment. This approach minimizes operational risk while supporting rapid iteration and continuous improvement. TSCTI will also define the integration framework and API architecture. This framework will govern how external data sources, state portals, and third-party applications connect to the Commons. Standardized APIs, supported by schema validation and access logging, will ensure interoperability with platforms such as MassGIS, MBTA, and the Department of Public Health while protecting data integrity and access rights.

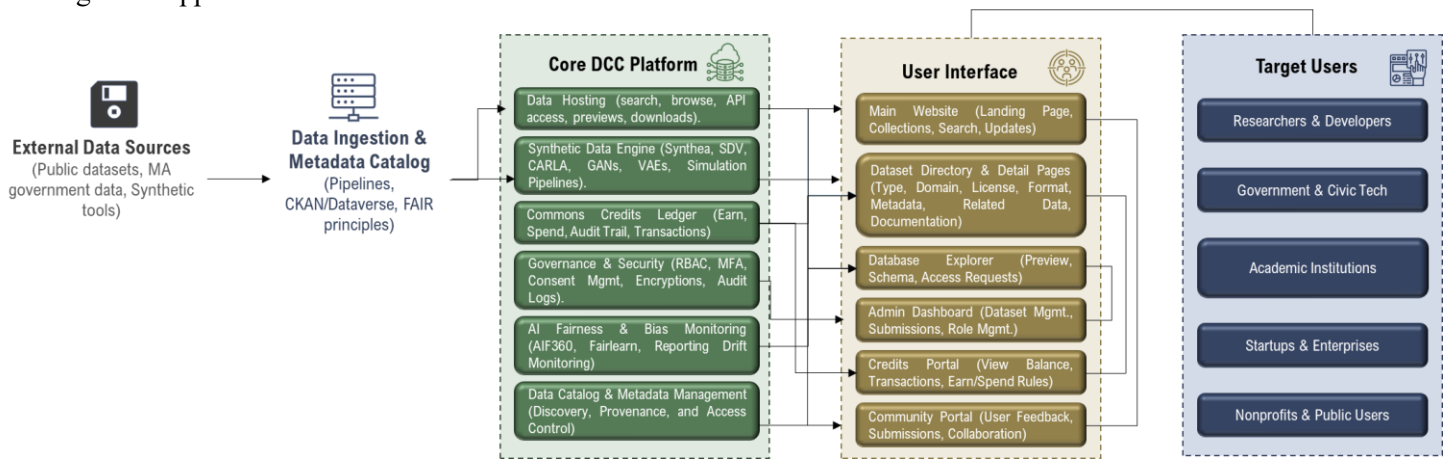
Concurrently, TSCTI will implement a multi-tiered identity and access management framework. This framework will include single sign-on (SSO), multi-factor authentication (MFA), and role-based access controls (RBAC) aligned with state cybersecurity policies. Access tiers will distinguish between public users, approved researchers, administrators, and governance board members. Integration with existing state identity providers (such as Azure AD or state directory services) will ensure seamless onboarding for agency staff and external collaborators while maintaining strict access controls.



With the infrastructure in place, we will establish development, testing, and production environments, each isolated and governed by DevSecOps pipelines. These pipelines will enforce automated testing, security scanning, accessibility validation (ADA/WCAG 2.1 AA), and compliance checks before any deployment. This approach reduces operational risk while enabling rapid iteration and continuous improvement. TSCTI will also define the integration and API framework that governs how external data sources, state portals, and third-party applications connect to the Commons. Standardized APIs with schema validation, access logging, and throttling controls will ensure secure and reliable interoperability with critical systems such as MassGIS, MBTA, and Department of Public Health datasets, while safeguarding data integrity and provenance.

The culmination of this Stage will be the Infrastructure and Architecture Blueprint, documenting the technical design, access models, security and accessibility controls, and integration points. This blueprint will serve as both a governance artifact for oversight and a technical reference for delivery teams throughout the program lifecycle. Through this Stage, TSCTI will ensure that the Data Commons Collaborative is launched on a future-ready, secure, accessible, and standards-compliant foundation, capable of supporting petabyte-scale datasets, tens of thousands of users, and seamless cross-agency interoperability without compromising security, compliance, or performance. ***Deliverables – Stage 2***

- ✓ Cloud Infrastructure Environment — provisioned, secured, and compliant environment (Azure/AWS/Google Cloud)
- ✓ Identity & Access Framework — SSO, MFA, RBAC integrated with state identity systems
- ✓ Environment Provisioning — development, testing, and production environments with CI/CD and DevSecOps pipelines
- ✓ Integration & API Framework — standardized APIs, schema validation, logging, interoperability design
- ✓ Accessibility-Ready Foundations — infrastructure aligned with ADA and WCAG 2.1 AA accessibility standards
- ✓ Infrastructure & Architecture Blueprint — formal documentation of architecture, security, accessibility, and integration approach


External Data Sources
(Public datasets, MA government data, Synthetic tools)
Data Ingestion & Metadata Catalog
(Pipelines, CKAN/Dataverse, FAIR principles)
Core DCC Platform
Data Hosting (search, browse, API access, previews, downloads).
Synthetic Data Engine (Synthea, SDV, CARLA, GANs, VAEs, Simulation Pipelines).
Commons Credits Ledger (Earn, Spend, Audit Trail, Transactions)
Governance & Security (RBAC, MFA, Consent Mgmt, Encryptions, Audit Logs).
AI Fairness & Bias Monitoring (AIF360, Fairlearn, Reporting Drift Monitoring)
Data Catalog & Metadata Management (Discovery, Provenance, and Access Control)
User Interface
Main Website (Landing Page, Collections, Search, Updates)
Dataset Directory & Detail Pages (Type, Domain, License, Format, Metadata, Related Data, Documentation)
Database Explorer (Preview, Schema, Access Requests)
Admin Dashboard (Dataset Mgmt., Submissions, Role Mgmt.)
Credits Portal (View Balance, Transactions, Earn/Spend Rules)
Community Portal (User Feedback, Submissions, Collaboration)
Target Users
Researchers & Developers
Government & Civic Tech
Academic Institutions
Startups & Enterprises
Nonprofits & Public Users

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Phase 2: Infrastructure & Setup

- ***Stage 3 – Data Ingestion & Metadata Catalog***

TSCTI understands that the value of the Data Commons Collaborative lies in its ability to curate, harmonize, and make discoverable heterogeneous datasets contributed by state agencies, research institutions, and external partners. Hence, our Stage 3 focuses on building the ingestion pipelines, metadata catalog, and curation framework that transform fragmented data sources into a coherent, standards-driven knowledge asset for Massachusetts.

The first step in this Stage is the development of automated ingestion pipelines. TSCTI will configure workflows to acquire data from multiple formats and systems, including structured (CSV, JSON, relational databases), semi-structured (APIs, XML feeds), unstructured (documents, logs), and geospatial sources. Tools such as Apache NiFi, Airflow, and Azure Data Factory will be deployed to manage data flows, orchestrate scheduling, and apply automated quality checks. Each pipeline will be designed with built-in validation, schema harmonization, and logging to ensure transparency and reproducibility. By automating ingestion, the Commons will significantly reduce onboarding time for new datasets while maintaining consistent quality controls.

Following ingestion, TSCTI will implement the metadata catalog that enables users to discover, access, and evaluate datasets. Leveraging open-source frameworks such as CKAN, Dataverse, and DataHub, combined with enterprise-grade enhancements where necessary, we will establish a metadata system that is scalable, extensible, and interoperable with external portals. Metadata standards will be enforced through the adoption of FAIR principles and internationally recognized schemas, including DCAT (Data Catalog Vocabulary) for interoperability, Dublin Core for descriptive metadata, and ISO 19115 for geospatial datasets. These standards ensure that data sets hosted by the Commons can be seamlessly linked with other state, national, and global initiatives. In parallel, TSCTI will implement a dataset curation process to maintain the quality and integrity of the catalog. This process will include profiling of datasets, automated anomaly detection, version control, and enrichment with contextual metadata (e.g., provenance, licensing, usage restrictions). Our governance team will collaborate with data stewards from contributing agencies to define curation rules and review procedures, ensuring that only validated, high-value datasets are published.

The technical delivery of this Stage will be led by TSCTI's Data Engineering and Metadata Management teams, supported by domain-specific data stewards from partner agencies. Data engineers will design and implement the ingestion pipelines, while metadata specialists configure the catalog and enforce standards. Governance leads will oversee quality assurance, compliance, and approval processes, ensuring that published datasets meet established criteria for accuracy, usability, and ethical compliance.

The culmination of this Stage will be a fully operational metadata catalog and ingestion framework, populated with the initial dataset inventory established in Stage 1. This catalog will allow researchers, policymakers, and innovators to easily discover datasets, assess their relevance, and integrate them into AI models and analyses. ***Deliverables – Stage 3***

- ✓ Automated Ingestion Pipelines—workflows for multi-format datasets with validation and harmonization
- ✓ Metadata Catalog—an operational system built on CKAN/Dataverse/DataHub with FAIR-compliant schemas
- ✓ Standards Implementation—enforcement of DCAT, Dublin Core, ISO 19115, and FAIR principles
- ✓ Dataset Curation Framework—policies, rules, and tools for profiling, validation, and version control
- ✓ Initial Catalog Population – ingestion and curation of prioritized datasets defined in Stage 1

Phase 3: Development

- ***Stage 4 – Commons Credits System***

TSCTI will create the Commons Credits System as a transparent governance and incentive mechanism, building on our experience deploying tokenized ledger systems for academic consortia and public-sector data platforms. Credits will not only serve as access tokens during this Stage but also as instruments of accountability, efficiency, and equitable usage throughout the ecosystem.

The first activity in this Stage will be the design of the credits ledger. TSCTI will architect a centralized, secure, and auditable ledger system capable of tracking the issuance, redemption, and transfer of credits. This ledger will be implemented using relational technologies (PostgreSQL, SQL Server) for scalability and reliability, with optional support for distributed ledgers (e.g., Hyperledger Fabric or smart contract frameworks) where immutable auditability is required. The ledger will integrate directly with the metadata catalog and dataset access workflows, ensuring that every transaction is automatically recorded.

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Following the technical foundation, TSCTI will work with the governance board to define issuance and redemption rules. Issuance rules will determine how credits are allocated to users, for example, through institutional memberships, research grants, or specific project approvals. Redemption rules will govern how credits can be spent, including dataset access, compute resources, or synthetic data generation. These policies will be codified into the system as configurable parameters, allowing flexibility as governance evolves. Additionally, to keep the transparency, TSCTI will deliver dashboards for monitoring and reporting credit usage. Built on platforms such as Power BI, Tableau, or Superset, these dashboards will provide both system administrators and end-users with visibility into credit balances, usage history, and redemption trends. Governance board members will have access to oversight views, enabling them to monitor patterns, detect anomalies, and ensure that credits are being used in accordance with established policies.

To ensure seamless adoption, the Commons Credits System will be integrated directly into dataset access workflows. When a user requests access to a dataset or service, the system will automatically verify the credit balance, deduct the appropriate amount, and update the ledger in real time. This frictionless integration ensures that credits function as a natural part of the user experience rather than a separate administrative burden. *For instance,* consider a researcher at the University of Massachusetts who requires access to a sensitive health dataset hosted in the Commons. Upon logging in, the researcher's institutional account reflects a credit allocation approved by their department. When the researcher requests the dataset, the Commons Credits System automatically checks their credit balance, deducts the required amount, and records the transaction in the ledger. At the same time, the researcher's dashboard updates in real time to show remaining credits and usage history, while the governance board dashboard reflects the transaction for oversight purposes. This end-to-end flow demonstrates how credits streamline access while maintaining transparency and accountability.

This Stage will be executed by TSCTI's Solution Architects and Application Development teams, with governance oversight from the Commons board. Architects will design the ledger and workflows, developers will implement the dashboards and system logic, and governance representatives will validate issuance and redemption policies. ***Deliverables:***

- ✓ Commons Credits Ledger—a centralized, secure system for tracking issuance, redemption, and transfer of credits
- ✓ Issuance & Redemption Framework—formalized policies configured in system rules and workflows
- ✓ Transparency Dashboards—role-based views for users, administrators, and governance board members
- ✓ Workflow Integration—automated linkage of credit checks and deductions within dataset access processes
- ✓ Operational Documentation—credit governance guidelines, user instructions, and administrative manuals

➢ ***Stage 5 – Synthetic Data Environment***

As practitioners of privacy-preserving AI, with expertise in frameworks such as SDV, Synthea, Gretel.ai, and CARLA, TSCTI will deliver a Synthetic Data Environment that balances analytical utility with stringent confidentiality requirements. In this Stage, we will deploy advanced synthetic data tools, validate fidelity against real datasets, and embed NIST differential privacy safeguards to meet state and federal compliance standards.

The implementation begins with the deployment of synthetic data generation frameworks. TSCTI will establish an environment that leverages proven open-source and commercial tools, including the Synthetic Data Vault (SDV) for statistical modeling, Synthea for healthcare simulations, Gretel.ai for machine learning–based generation, and CARLA for tabular and structured use cases. These tools will be orchestrated within a scalable compute environment, allowing researchers and data stewards to generate synthetic versions of real-world datasets on demand. Once generation capabilities are in place, TSCTI will conduct fidelity validation against real data. Using distributional similarity metrics such as the Kolmogorov–Smirnov test, Wasserstein distance, and mutual information scores, we will quantify how closely synthetic datasets replicate the statistical properties of the source data. Additional validation will focus on utility testing (ensuring that models trained on synthetic data perform comparably to those trained on original data) and privacy testing (ensuring synthetic data does not allow re-identification of individuals). These validations will be formally documented, creating a reproducible framework for ongoing quality assurance.

To strengthen privacy, TSCTI will embed NIST differential privacy standards into the synthetic data pipeline. TSCTI is a top-secret facility with clearance from the DoD and DHS and operates as a SOC 2 Type 2 audited firm, backed by CMMC and FedRamp certification. Differential privacy mechanisms, such as noise injection and privacy budget allocation, will be applied to prevent the disclosure of sensitive attributes even when synthetic datasets are combined with external information. This approach ensures compliance with NIST SP 800-188 guidance on differential privacy and aligns with broader data

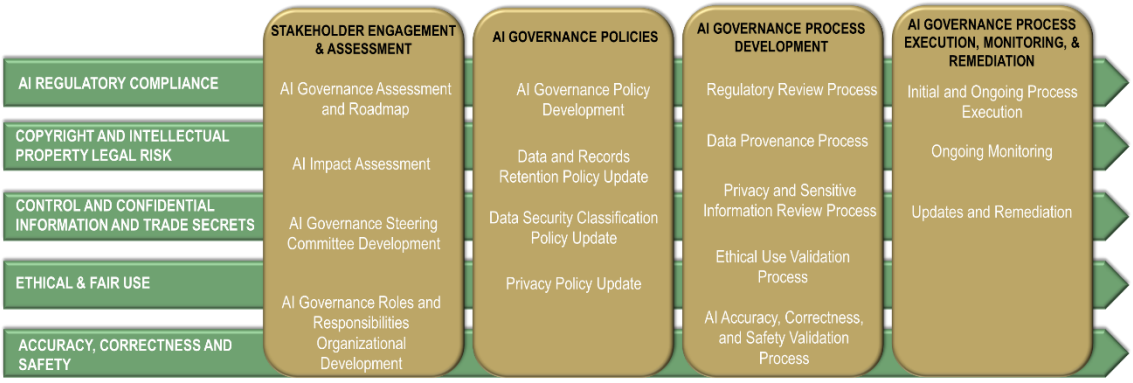
protection requirements, including HIPAA and GDPR. For instance, if a public health researcher at Massachusetts General Hospital seeks to study trends in diabetes prevalence across the state. Due to HIPAA restrictions, the original patient-level dataset cannot be broadly shared. Instead, the researcher requests access to a synthetic version of the dataset through the Commons. Using the Synthetic Data Environment, the system generates a synthetic dataset that mirrors the statistical properties of the original while stripping out any identifiable attributes. The researcher is then able to build predictive AI models and analyze population-level patterns without accessing sensitive patient information. Meanwhile, the governance board can verify that the synthetic dataset was generated and validated under strict privacy and fidelity standards, ensuring compliance and trust.

The Synthetic Data Environment will be managed by TSCTI's AI/ML Specialists and Data Privacy Engineers. AI specialists will configure generation models and tuning parameters, while privacy engineers will design validation frameworks and integrate compliance safeguards. Governance representatives from contributing agencies will participate in testing to confirm that synthetic outputs align with both research utility and ethical standards. ***Deliverables:***

- ✓ Synthetic Data Environment—operational environment with SDV, Synthea, Gretel.ai, CARLA deployed
- ✓ Validation Framework – documented fidelity and privacy testing protocols with reproducibility guarantees
- ✓ Differential Privacy Integration – NIST-compliant privacy safeguards embedded into generation workflows
- ✓ Synthetic Dataset Catalog Entries – published synthetic datasets linked to metadata catalog with access controls
- ✓ Compliance Documentation—validation reports, privacy impact assessments, and usage guidelines for synthetic data

➢ ***Stage 6 – AI Fairness & Bias Framework***

Ensuring fairness, transparency, and accountability in AI-driven analytics is essential to building public trust and meeting ethical obligations. Many datasets inherently carry social, demographic, or systemic biases, which, if not addressed, can result in inequitable outcomes. In Stage 6, we will establish the AI Fairness & Bias Framework to systematically detect, measure, and mitigate bias in both datasets and models, ensuring that the Data Commons Collaborative operates within the principles of responsible AI. TSCTI will begin by integrating industry-standard fairness tools directly into the Commons environment. Our team will deploy frameworks such as IBM's AI Fairness 360 (AIF360) for bias detection, Microsoft's Fairlearn for fairness-constrained model optimization, and explainability libraries such as SHAP and LIME for model transparency. These tools will be embedded into the data and model workflows, enabling both automated and on-demand fairness assessments.


AI REGULATORY COMPLIANCE
COPYRIGHT AND INTELLECTUAL PROPERTY LEGAL RISK
CONTROL AND CONFIDENTIAL INFORMATION AND TRADE SECRETS
ETHICAL & FAIR USE
ACCURACY, CORRECTNESS AND SAFETY
STAKEHOLDER ENGAGEMENT & ASSESSMENT
AI Governance Assessment and Roadmap
AI Impact Assessment
AI Governance Steering Committee Development
AI Governance Roles and Responsibilities Organizational Development
AI GOVERNANCE POLICIES
AI Governance Policy Development
Data and Records Retention Policy Update
Data Security Classification Policy Update
Privacy Policy Update
AI GOVERNANCE PROCESS DEVELOPMENT
Regulatory Review Process
Data Provenance Process
Privacy and Sensitive Information Review Process
Ethical Use Validation Process
AI Accuracy, Correctness, and Safety Validation Process
AI GOVERNANCE PROCESS EXECUTION, MONITORING, & REMEDIATION
Initial and Ongoing Process Execution
Ongoing Monitoring
Updates and Remediation

In parallel, we will design and implement bias detection and mitigation dashboards. These dashboards will provide role-based access, with researchers able to review fairness metrics such as disparate impact and equalized odds, while governance board members will monitor aggregate fairness reports and receive alerts on potential bias drift. By embedding continuous monitoring, the system will ensure that models remain equitable even as datasets evolve or retraining occurs. Our framework will be fully aligned with the NIST AI Risk Management Framework (AI RMF) and complemented by emerging standards such as ISO/IEC TR 24028 (AI trustworthiness) and IEEE P7003 (algorithmic bias considerations). We will operationalize these standards into Commons governance workflows, requiring that fairness assessments and documentation be completed before datasets or models are approved for release.

This Stage will be executed by our AI/ML specialists and data ethics engineers, supported by agency data stewards. Our specialists will implement the fairness tools and dashboards, while governance representatives will validate criteria, review bias assessments, and authorize mitigation steps. ***Deliverables:***

- ✓ Integrated Fairness Toolset—AIF360, Fairlearn, SHAP, and LIME operationalized within Commons workflows
- ✓ Bias Detection & Mitigation Dashboards—role-based dashboards with fairness metrics, drift monitoring, and audit trails
- ✓ Compliance Alignment—operationalization of NIST AI RMF, ISO/IEC, and IEEE standards into governance processes

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- ✓ Fairness Documentation Framework – templates and workflows for documenting bias assessments and mitigation steps
- ✓ Applied Pilot Validations—fairness assessments applied to representative use cases in transportation, health, and education

Phase 4: Testing & Governance

➢ ***Stage 7 – Governance, Security & Compliance***

Being ISO 27001 certified and with a track record of delivering HIPAA-, GDPR-, and FedRAMP-compliant systems, TSCTI brings proven expertise in designing governance and security frameworks for sensitive data environments. In this Stage, we will implement robust role-based access controls, encryption, immutable audit trails, and governance policies that ensure the Commons operate securely, transparently, and in full compliance with applicable standards.

We will begin by operationalizing the governance framework established in Stage 1. A multi-stakeholder Governance Board will be convened, comprising representatives from state agencies, academic institutions, and research communities. This board will oversee decision-making on dataset inclusion, credit allocation, synthetic data release, and fairness compliance. To support its function, we will establish formal governance policies covering data contribution, usage rights, escalation procedures, and audit requirements. Governance workflows will be embedded directly into the Commons platform, ensuring that approvals, reviews, and exceptions are systematically captured and traceable.

In parallel, we will implement a comprehensive security and access control architecture. Identity and access management will be anchored in role-based access controls (RBAC) to differentiate permissions across public users, approved researchers, administrators, and governance members. Access will be reinforced by multi-factor authentication (MFA) for sensitive datasets and administrative functions. Data will be protected using encryption in transit (TLS 1.2+) and at rest (AES-256), ensuring confidentiality throughout the data lifecycle. To safeguard integrity and accountability, we will deploy immutable logging and audit trails. All user actions—from dataset access requests to credit redemptions and governance approvals—will be recorded in append-only logs. These logs will integrate with Security Information and Event Management (SIEM) tools such as Splunk or ELK Stack, enabling real-time monitoring, anomaly detection, and forensic analysis.

We will align the Commons with HIPAA for health data, GDPR for privacy protections, and FedRAMP Moderate/High controls for cloud-based operations. Our CISSP-certified security architects and compliance specialists will map each requirement to technical safeguards and governance processes. We will also facilitate regular security audits and penetration testing, ensuring that the Commons continuously meets or exceeds regulatory expectations.

This Stage will be delivered by our Security & Compliance Practice, working closely with the Governance Board and agency data stewards. Security architects will implement technical safeguards, compliance officers will design and validate policies, and governance representatives will oversee enforcement and accountability. ***Deliverables:***

- ✓ Governance Board Charter – structure, roles, and operating procedures for cross-agency governance
- ✓ Governance Policies & Workflows—formalized policies for data contribution, approvals, usage rights, and escalation
- ✓ Identity & Access Controls – RBAC and MFA policies implemented across all platform tiers
- ✓ Data Protection Measures—encryption in transit and at rest, secure key management protocols
- ✓ Audit & Logging System—immutable logs, SIEM integration, and forensic monitoring capabilities
- ✓ Compliance Alignment Reports – documentation of HIPAA, GDPR, and FedRAMP adherence with mapped safeguards
- ✓ Security Audit Results—penetration testing reports and remediation documentation

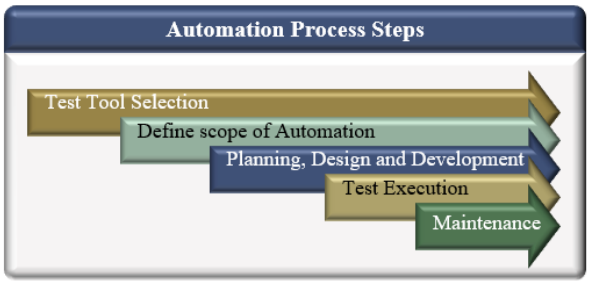
➢ ***Stage 8 – Testing & Quality Assurance***

To ensure that the Data Commons Collaborative meets its functional, security, and performance requirements, TSCTI will execute a structured Testing and Quality Assurance (QA) program. This Stage validates that the platform operates as designed, is resilient under load, safeguards sensitive data, and provides an intuitive and reliable user experience. We will begin with functional testing to validate the accuracy and completeness of core features. This will include dataset ingestion workflows, metadata catalog functions, credit system transactions, synthetic data generation, and fairness dashboards. Each

TSCTI's Quality Credentials

- ❖ *ISO 9001 registered/certified QMS*
- ❖ *ISO 27001 certified processes*
- ❖ *ISO 20000-1 certified processes*
- ❖ *CMMI Level 3 certified processes*
- ❖ *Certified Corporate Quality Appraisers/Auditors*

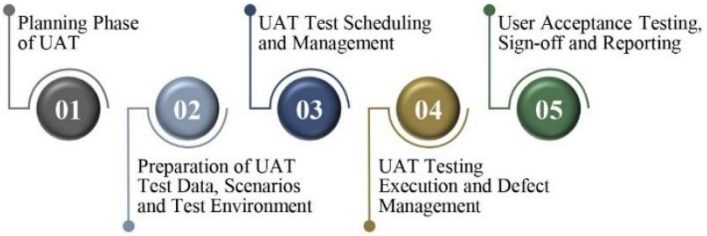
function will be tested against predefined acceptance criteria, ensuring that requirements captured during earlier Stages are fully satisfied.



Automated regression tests will also be established to ensure that future updates do not introduce defects. TSCTI's use of the automated testing process is based on the principle of maximum ROI. We will adopt the appropriate methodology for using automated testing. Our usage of the automation process is based on the scope of automation requirements before the project commencement (**Error! Reference source not found.** in the figure). We select the right automation tool and the appropriate framework that is ideal for software development. Depending on the scope and tool selected, our team plans to design and develop the process required therein. Once the above steps are carried out, the test is then executed, which is then followed by maintenance. In conducting automated testing, our team adheres to the industry's best practices for writing automated scripts. As the measurement of metrics during the automation process is critical, TSCTI acutely investigates several parameters—the percentage of defects found, the time required for automation testing in each release cycle, and the minimal time taken for release, customer satisfaction index, and productivity improvement. We ensure infrastructure designs and recommendations are approved by the DCC Architecture Review Board and IT Operations Team.

Following functional testing, our security specialists will conduct penetration testing and vulnerability assessments. These tests will simulate real-world attack scenarios to identify potential vulnerabilities across the application, APIs, identity management system, and infrastructure. Findings will be triaged by severity, and remediation will be tracked through our issue management system. This proactive approach ensures compliance with state and federal security standards and demonstrates readiness for independent audits.

We will also execute load and performance testing to confirm that the Commons can support large-scale usage. Using tools such as Apache JMeter and Locust, we will simulate thousands of concurrent users and benchmark system responsiveness across query execution, dataset downloads, and dashboard rendering. These tests will validate that the platform can meet required service levels, such as sustaining <2-second query times across high-volume workloads. For data integrity, we will implement dataset validation protocols. Ingestion pipelines will be tested to confirm schema adherence, metadata accuracy, and completeness. Automated validation scripts will flag anomalies, while governance-approved sampling will confirm quality. These steps ensure that datasets published through the Commons meet the standards of trust and reproducibility required by researchers and agencies.



Finally, we will conduct User Acceptance Testing (UAT) with representatives from government agencies, academic institutions, and research communities. UAT will validate not only functionality but also usability, ensuring that workflows are intuitive, dashboards are meaningful, and access policies behave as expected. Feedback gathered during UAT will be incorporated into refinements before the production release.

As part of our comprehensive QA program, we will conduct accessibility testing in alignment with ADA and WCAG 2.1 AA standards. This will include validation with screen readers (JAWS, NVDA), color contrast analyzers, and keyboard-only navigation scenarios. Automated accessibility testing tools (such as Axe and Lighthouse) will be supplemented by manual testing to ensure real-world usability. Findings will be documented and remediated prior to production rollout, ensuring the Commons is not only technically sound but also universally accessible**.** This Stage will be executed by our quality assurance engineers, security architects, and program management office, in collaboration with agency and academic stakeholders, for UAT. QA engineers will develop and run test cases, security architects will lead penetration and compliance testing, and the PMO will track defects, remediation, and sign-offs against milestones.

Deliverables:

- ✓ Functional Test Plans & Reports – validation of ingestion, catalog, credits, synthetic data, and fairness features
- ✓ Security Testing Results – penetration test reports, vulnerability assessments, remediation logs

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- ✓ Performance Benchmark Reports – load and stress testing results with capacity planning metrics
- ✓ Dataset Validation Reports – schema compliance, metadata accuracy, and anomaly detection outcomes
- ✓ User Acceptance Test Reports – stakeholder signoffs, feedback logs, and refinement documentation
- ✓ Accessibility Compliance Reports – results from ADA and WCAG 2.1 AA accessibility testing (screen readers, contrast checks, keyboard navigation) with remediation plans
- ✓ Quality Assurance Dashboard—consolidated tracking of defects, remediation, and readiness for production launch

Phase 5: Rollout & Adoption

➢ ***Stage 9 – Training & Adoption***

As part of our Education and Capacity Building practice, TSCTI has designed training programs that have onboarded thousands of users across statewide platforms. In this Stage, we will deliver structured training modules, onboarding sessions, and community engagement features to ensure that researchers, policymakers, and administrators can adopt and fully leverage the Commons from day one.

We will begin by developing structured training modules tailored to the needs of distinct user groups. Modules will include role-based tracks for public users, agency administrators, researchers, and governance board members. Training will cover core platform functions such as dataset discovery, credit usage, synthetic data access, and fairness dashboards, as well as advanced features such as dataset submission and annotation. Modules will be delivered through a combination of self-paced e-learning (via an integrated Learning Management System), instructor-led workshops, and recorded webinars to maximize accessibility.

To accelerate early adoption, we will conduct onboarding sessions for key stakeholder groups. These sessions will focus on hands-on demonstrations, guided exercises, and use-case walkthroughs, ensuring that early adopters understand not only how to use the platform but also how to integrate it into their research and decision-making workflows. Onboarding will also include "train-the-trainer" sessions, enabling agency and institutional staff to serve as local champions for ongoing knowledge dissemination. In parallel, we will implement community engagement features within the platform to encourage collaboration and participation. This will include dataset submission portals where users can propose new contributions, annotation tools that allow researchers to provide feedback or contextual notes on datasets, and peer-review workflows that strengthen dataset quality. Engagement dashboards will track contributions, highlight active users, and surface community-driven insights, thereby creating a culture of shared ownership. We will also publish comprehensive user documentation and adoption toolkits. These resources will include user guides, quick reference sheets, governance FAQs, and best-practice checklists. Documentation will be continuously updated as the platform evolves, ensuring that users always have access to current information.

Required Training	Description	Training Material	Deliverables
User Training	In-depth training sessions aimed at equipping DCC staff with the necessary skills to operate the system	Quick start guides, user manuals, video tutorials	Proficient users capable of utilizing system functionalities effectively
Trainer Training	Train-the-Trainer workshops to empower DCC trainers to conduct future training sessions	Trainer manuals, presentation slides, role-playing exercises	Certified trainers ready to deliver training sessions
Test Team Training	Extensive training sessions for the testing team to thoroughly understand and validate all system modules	Test scripts, test cases, system documentation	Competent testing team capable of system evaluation
IT Staff Training	Technical knowledge transfer sessions to ensure DCC technical staff understand system architecture	Technical manuals, configuration guides, hands-on workshops	Skilled technical staff capable of managing system operations
Project Closeout Training	Final training sessions during Transition Out activities to update staff on recent system changes	Update documentation, transition guides, Q&A sessions	Staff proficient in recent system updates and changes

This Stage will be led by our CoE, supported by certified trainers. Trainers and instructional designers will develop content, technical staff will support live onboarding, and community engagement specialists will oversee portals and feedback loops.

Deliverables:

- ✓ Training Modules—role-based e-learning content, instructor-led workshops, and webinars
- ✓ Onboarding Sessions—hands-on demonstrations and train-the-trainer programs for agencies and institutions
- ✓ Community Engagement Features—submission portals, annotation tools, and peer-review workflows integrated into the platform

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- ✓ User Documentation & Adoption Toolkits—guides, quick references, FAQs, and best-practice materials
- ✓ Engagement Dashboards—analytics on participation, contributions, and adoption trends

➢ ***Stage 10 – Rollout & Operations***

Building on our experience launching large-scale state data platforms into production, TSCTI will manage the critical transition from development to live operations. In this Stage, we will deploy the production environment, scale user onboarding, establish operational monitoring, and implement continuous optimization mechanisms to ensure the Commons delivers consistent value. We will begin by deploying the production environment, configured with security, governance, and access controls established in earlier Stages. This environment will be provided for high availability and fault tolerance, with automated backup and disaster recovery protocols in place. The production launch will be governed by a formal go/no-go readiness review, ensuring that all milestones from testing and quality assurance have been validated before public release.

Once operational, we will initiate the onboarding of users at scale. Building on the training and adoption activities from Stage 9, we will coordinate with state agencies, research institutions, and community organizations to activate user accounts, assign roles, and confirm access rights. Our program team will provide early-life support through dedicated helpdesk channels and responsive technical assistance, ensuring that adoption momentum is not disrupted by technical barriers.

In parallel, we will establish a comprehensive monitoring framework to track platform performance, credit usage, and fairness drift in real time. Monitoring dashboards will be configured to provide role-specific views: system administrators will track health and performance metrics for infrastructure, governance board members will review credit transaction reports and usage trends, and fairness dashboards will highlight potential bias drift in datasets and models. Alerts and anomaly detection mechanisms will ensure that issues are surfaced quickly and addressed proactively.

A key feature of this Stage will be the implementation of reporting dashboards for transparency and accountability. Using tools such as Power BI and Superset, we will deliver role-based reporting on key indicators, including dataset activity, community engagement, fairness compliance, and credit utilization. These dashboards will be made available to governance stakeholders and agency leaders, providing evidence-based insights into how the Commons is used and where optimizations are required. Finally, we will execute a structured feedback and optimization process. End-user feedback will be collected through surveys, workshops, and in-platform feedback tools. This input will be triaged and prioritized by the governance board and incorporated into iterative releases using agile delivery methods. This ensures that the Commons remains responsive to user needs and continues to evolve in alignment with its mission.

This Stage will be executed by our Operations and Support Team, working in close coordination with governance representatives and agency liaisons. Operations engineers will manage system monitoring and incident response, data analysts will maintain dashboards, and the governance board will review reporting outputs and approve optimization initiatives. ***Deliverable:***

- ✓ Production Environment Launch—live system deployment with high availability, backup, and recovery
- ✓ User Onboarding Program – activated accounts, validated roles, and early-life support services
- ✓ Operational Monitoring Framework – infrastructure, credit, and fairness drift monitoring with alerts
- ✓ Reporting Dashboards—role-based dashboards covering usage, performance, compliance, and engagement
- ✓ Feedback & Optimization Plan—a structured process for continuous improvement based on user and governance input

➢ ***Stage 11 – Sustainability & Extensibility***

With a focus on long-term platform stewardship, TSCTI will establish practices and technologies that ensure the Commons remains adaptable, interoperable, and future-ready. In this Stage, we will embed sustainability mechanisms, extensible architectures, and governance models that enable the Commons to evolve with emerging technologies and interoperate with cross-state and federal initiatives.

We will begin by developing a sustainability strategy in collaboration with the governance board. This strategy will define funding mechanisms (e.g., institutional memberships, federal partnerships, grant-supported initiatives), staffing requirements, and long-term operational roles. By aligning governance policies with sustainability objectives, we will ensure that the Commons has a stable foundation for ongoing operations and expansion. To support interoperability and broader collaboration, we will design the platform for cross-state and federal integration. This will include adopting standardized

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metadata and API frameworks that enable linkages with federal repositories (e.g., NIH, DOT, DOE), as well as potential partnerships with other state-level data initiatives. By enabling seamless integration, Massachusetts will position the Commons as a node in a national data ecosystem, extending its impact while preserving local control.

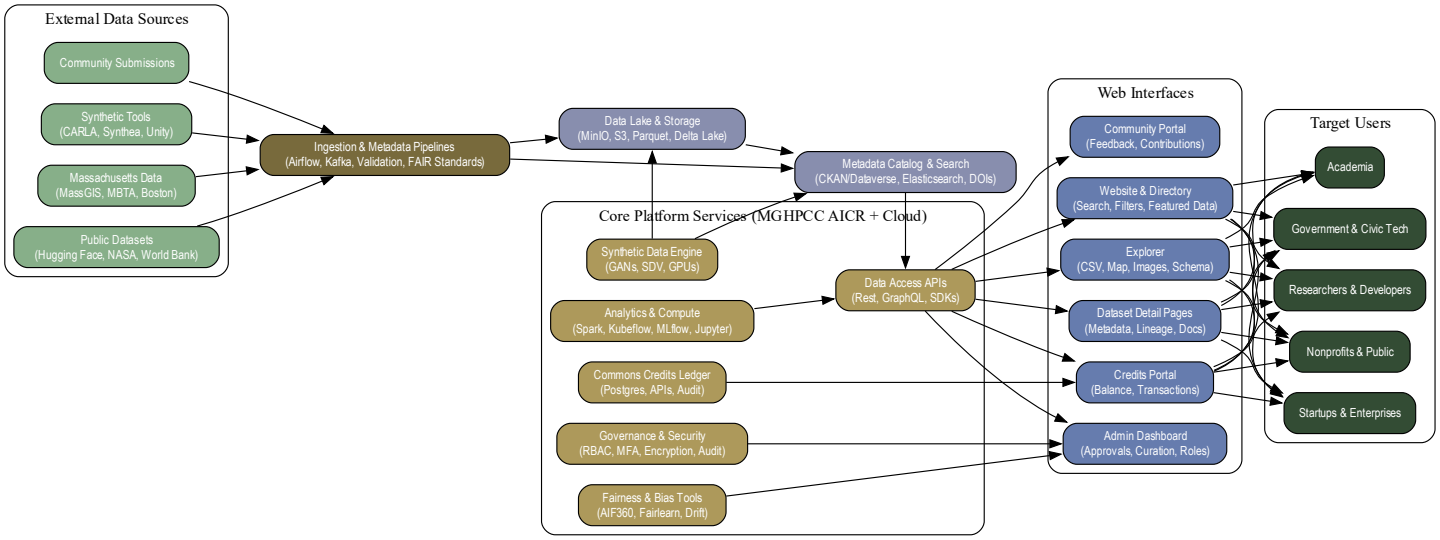
For accountability and data integrity, we will explore blockchain-enabled audit trails. By leveraging distributed ledger technologies such as Hyperledger or Ethereum-based smart contracts, we will provide immutable records of dataset contributions, credit transactions, and governance approvals. These audit trails will strengthen trust by ensuring that all critical operations within the Commons are transparently verified.

Continuous improvement will be embedded through CI/CD pipelines that support ongoing enhancements. Using tools such as Azure DevOps, GitHub Actions, and Jenkins, we will automate testing, security scans, and deploy updates to ensure that the Commons evolves rapidly without compromising stability or compliance. This approach will reduce release cycles, support feature expansion, and allow the platform to adopt emerging standards as they mature. Finally, we will strengthen long-term governance. The Governance Board established earlier will be formalized into a permanent multi-stakeholder entity with authority over strategic direction, funding allocation, compliance oversight, and sustainability planning. Governance policies will be periodically reviewed and updated to reflect new legislation, evolving community needs, and emerging AI ethics frameworks.

This Stage will be led by our Strategic Planning and Enterprise Architecture Teams, working hand in hand with governance board members, state agency leaders, and federal liaisons. Architects will design extensibility mechanisms, DevOps engineers will manage CI/CD pipelines, and governance representatives will ensure alignment with long-term policy objectives. ***Deliverables***

- ✓ Sustainability Strategy – documented plan for funding, staffing, and operational continuity
- ✓ Integration Framework—standards and APIs for interoperability with federal and cross-state data initiatives
- ✓ Blockchain Audit Trail Prototype – immutable ledger for dataset provenance, credit transactions, and approvals
- ✓ CI/CD Pipelines—automated testing, compliance validation, and deployment workflows for continuous improvement
- ✓ Long-Term Governance Framework – updated governance charter and policies with sustainability provisions

High Level architecture Diagram


External Data Sources
Community Submissions
Synthetic Tools (CARLA, Synthea, Unity)
Massachusetts Data (MassGIS, MBTA, Boston)
Public Datasets (Hugging Face, NASA, World Bank)
Ingestion & Metadata Pipelines (Airflow, Kafka, Validation, FAIR Standards)
Data Lake & Storage (MinIO, S3, Parquet, Delta Lake)
Metadata Catalog & Search (CKAN/Dataverse, Elasticsearch, DOIs)
Core Platform Services (MGHPCC AICR + Cloud)
Synthetic Data Engine (GANs, SDV, GPUs)
Analytics & Compute (Spark, Kubeflow, MLflow, Jupyter)
Commons Credits Ledger (Postgres, APIs, Audit)
Governance & Security (RBAC, MFA, Encryption, Audit)
Fairness & Bias Tools (AIF360, Fairlearn, Drift)
Data Access APIs (Rest, GraphQL, SDKs)
Web Interfaces
Community Portal (Feedback, Contributions)
Website & Directory (Search, Filters, Featured Data)
Explorer (CSV, Map, Images, Schema)
Dataset Detail Pages (Metadata, Lineage, Docs)
Credits Portal (Balance, Transactions)
Admin Dashboard (Approvals, Curation, Roles)
Target Users
Academia
Government & Civic Tech
Researchers & Developers
Nonprofits & Public
Startups & Enterprises

Phase	Stage	Activities	Milestones / Deliverables	Estimated Duration
1. Initiation & Design	***Stage** 1 – Initiation & Planning*	Kickoff meetings, stakeholder alignment, governance setup, dataset inclusion criteria	Approved Project Charter, Initial Dataset List, Governance Framework	1 month
	***Stage** 2 – Infrastructure Setup & Architecture*	Provision cloud environment, IAM setup (SSO, MFA, RBAC), Dev/Test/Prod environments, integration framework	Infrastructure & Architecture Blueprint, API/Integration	1.5 months

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			Framework, Accessibility-Ready Foundations	
2. Infrastructure & Setup	***Stage** 3 – Data Ingestion & Metadata Catalog*	Build automated ingestion pipelines, metadata catalog (CKAN/Dataverse/DataHub), FAIR + standards compliance	Metadata Catalog Operational, Ingestion Pipelines Validated, Dataset Curation Framework	2 months
3. Development	***Stage** 4 – Commons Credits System*	Credits ledger design, issuance/redemption rules, dashboards, integration with workflows	Commons Credits Ledger Operational, Transparent Usage Dashboards	1.5 months
	***Stage** 5 – Synthetic Data Environment*	Deploy synthetic data tools (SDV, Synthea, CARLA), validate fidelity, embed differential privacy	Synthetic Data Environment Operational, Validation Reports, Compliance Documentation	1.5 months
	***Stage** 6 – AI Fairness & Bias Framework*	Integrate fairness tools (AIF360, Fairlearn, SHAP), build dashboards, align with NIST AI RMF	Fairness & Bias Dashboards Operational, Compliance Alignment Reports	2 months
4. Testing & Governance	***Stage** 7 – Governance, Security & Compliance*	Governance board operations, security controls (RBAC, MFA, encryption), immutable audit logging	Governance Policies Approved, Security & Compliance Alignment Reports, Audit Trail System	1.5 months
	***Stage** 8 – Testing & Quality Assurance*	Functional, security, load/performance, dataset validation, accessibility, UAT	Test Reports, Accessibility Compliance Results, QA Dashboard	1.5 months
5. Rollout & Adoption	***Stage** 9 – Training & Adoption*	Develop training modules, onboarding sessions, community engagement, publish documentation	Training Modules Delivered, Accessible Training Toolkits, Engagement Dashboards	1 month
	***Stage** 10 – Rollout & Operations*	Launch production environment, onboard users, operational monitoring, reporting dashboards	Production Environment Live, Monitoring Dashboards Operational, Feedback Loop Activated	1 month
	***Stage** 11 – Sustainability & Extensibility*	Long-term funding and staffing, cross-state/federal integration, blockchain audit trails, CI/CD pipelines	Sustainability Strategy, Governance Charter Update, CI/CD Pipelines Operational	1 month

Notes

- Total estimated program duration: ~14-16 months (phased, with some overlaps possible).
- Governance and security are continuous threads throughout all phases.
- Stages 8–11 emphasize operational readiness, adoption, and sustainability, not just technical build.
- **Flexibility is built into the timeline**: TSCTI can ramp up delivery speed, run selected Stages in parallel, or adjust Stage durations as required by the Commonwealth's priorities and stakeholder readiness.

Feasibility of the timeline to complete the program scope

At the heart of our project execution is a commitment to adhering to the work schedule with precision and reliability. Our approach is grounded in proven methodologies and industry best practices, ensuring that every phase of the development

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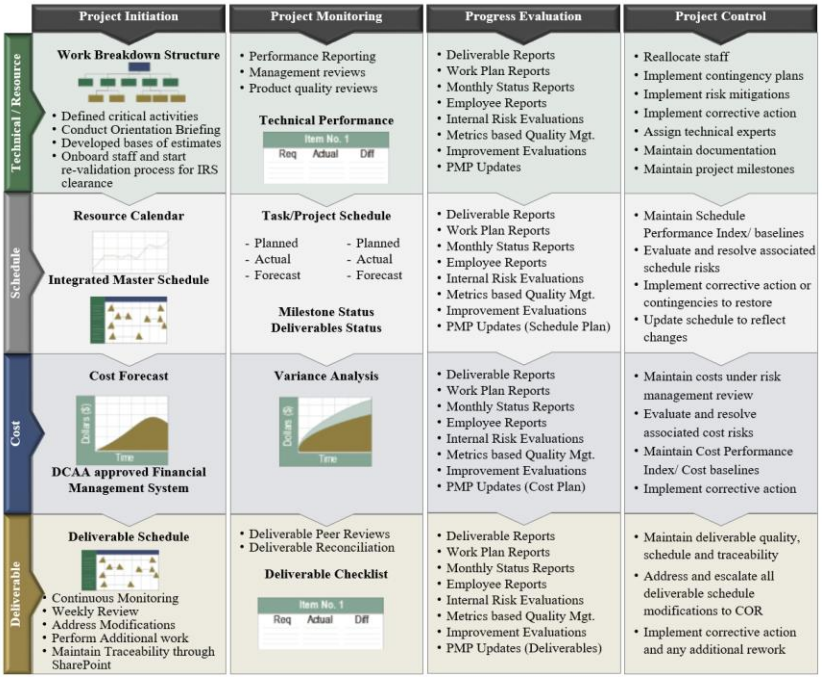
process is meticulously planned and executed. *We will utilize our proven methodology and experience of 28 years of implementing 400+ successful projects on time within budget.* To ensure that our chatbot development project adheres to the anticipated work schedule, we will employ a comprehensive approach incorporating best practices, industry standards, and proven methodologies. We will adopt the Agile methodology, which is renowned for its flexibility and iterative approach. Agile divides the project into manageable sprints, each lasting 2-4 weeks. This allows us to develop features incrementally, receive feedback, and make necessary adjustments quickly. By focusing on small, achievable goals and delivering working software at the end of each sprint, we can maintain momentum and ensure that the project progresses smoothly. Agile aligns with industry standards for project management and is endorsed by frameworks like Scrum and Kanban, which facilitate effective sprint planning, progress tracking, and retrospective analysis.



Our project will be supported by a dedicated team, led by a PMP-certified Account Director. This ensures that our project management adheres to the highest standards of professionalism and expertise. The Account Director will oversee the project's progress, coordinate between teams, and ensure that the project stays on track. This role will be crucial in managing client relationships, addressing concerns promptly, and making strategic decisions to keep the project aligned with your goals.

Our project management strategy will follow established best practices to ensure that we adhere to the work schedule. We will create a detailed project plan that outlines key milestones, deadlines, and deliverables. This plan will be tracked using Gantt charts, which provide a visual timeline of the project and help in monitoring progress against deadlines. Kanban boards will be used to visualize workflow and manage tasks, ensuring that team members can focus on priority items and that any bottlenecks are promptly addressed. Regular status reports and progress reviews will be conducted to assess whether we are meeting our milestones and to identify any potential risks or delays. Our processes will be governed by ISO-certified standards, ensuring that our approach is aligned with international best practices for quality and efficiency.

To streamline the development and deployment process, we will implement a DevOps approach. This involves integrating development and operations to enhance collaboration and efficiency. We will utilize Continuous Integration (CI) and Continuous Deployment (CD) practices, which automate the process of integrating code changes, running automated tests, and deploying updates. This approach ensures that new features and bug fixes are delivered quickly and reliably, reducing the time required for manual testing and deployment. By adopting CI/CD pipelines, we can maintain a steady pace of development and address issues in real time.

Additionally, we will establish regular touchpoints with stakeholders and team members, including daily stand-up meetings and weekly sprint reviews. These meetings will provide opportunities to discuss progress, address challenges, and realign priorities. Additionally, we will use collaboration tools such as Slack or Microsoft Teams for ongoing communication and JIRA or Asana for task management. This continuous dialogue ensures that everyone involved is aligned with the project goals and can contribute to problem-solving in a timely manner. We will also implement proactive risk management practices to identify and mitigate potential issues before they impact the project schedule. This includes conducting regular risk assessments and creating contingency plans for high-impact risks. Additionally, quality assurance (QA) processes, including automated and manual testing, will be integral to our development cycle. By ensuring that the chatbot meets quality standards and performs as expected, we can minimize rework and delays. Our quality assurance practices will be conducted in accordance with ISO-certified processes, guaranteeing that our work adheres to rigorous standards of

excellence. We implemented similar process *for a similar project for the Office of Personnel Management (OPM). In this project, we integrated a conversational chatbot into their website, allowing users to interact as if they were communicating with real staff members.*

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Proposed Team

- ***Resumes or bios of key personnel that will be performing the services.***

Qualifications and availability of proposed team

TSCTI is pleased to present a highly qualified team of professionals with proven expertise in Artificial Intelligence, Data Science, Cloud Platforms, and Enterprise Integration. Our team brings a unique blend of strategic vision, hands-on technical capability, and deep domain knowledge to ensure the success of this engagement. Collectively, they have led complex AI/ML implementations, designed scalable architectures, and delivered measurable business outcomes for Federal, State, and Fortune 500 clients. Each member has been carefully selected based on their experience relevant to the scope of this project, ensuring seamless alignment with client objectives and industry best practices. ***Below, we have provided detailed resumes of the proposed team:***

Chitharanjan Billa – Project Manager

Chitharanjan Billa – Project Manager (Availability 100%)

Brief Profile

With **25+ Years of experience in the IT Industry.** Currently, a key member of the Technology/Architecture team in **the Directorate of Administrative Programs at OSHA/U.S. Department of Labor, Washington, DC.** Leading large projects from scratch and executing program-management efforts on multiple Federal (US Government) information-technology projects involving IT infrastructure upgrade, Cloud migrations to USDA, and modernization efforts. Expert in Enterprise Cloud Integrations and Deployments of Oracle Products, Hadoop/Big-Data Architecture Application Development, and implementation. Senior officials of the US Department of Labor oversee these projects. Earlier, implemented an Oracle Project successfully at the U.S. Securities and Exchange Commission involving Oracle Database, a complete fusion middleware stack including identity management components. Excellent working knowledge of Oracle Fusion Middleware, Identity Management, and all of its components like OIM, OAM, LDAP/OID, Content Management, WebCenter, Oracle Secure Search, and Oracle WebLogic Server

Education

- **Executive MBA,** University of Technology Sydney, Australia (2013), Sponsored by Oracle Corp.
- **Bachelor of Technology,** Nagarjuna University, India (1988-1992) with First Class
- Member of **AUSTRALIAN COMPUTER SOCIETY (ACS)** – Dec 2006 to date
- Oracle Cloud Infrastructure Foundations 2021 Associate
- Oracle Machine Learning using Autonomous Database 2021 Certified Specialist
- Oracle Certified Associate
- Oracle Database 10g: New features for Administrators Ed 1
- Oracle Database 10g: Real Application Clusters Ed 1
- Oracle Database 11g: New Features for Administrators Ed 1
- M102: MongoDB for DBAs

Tools & Technologies

- Languages: Oracle SQL*PLUS, PL/SQL, Perl, Python, JavaScript, PHP, REST Services, Java
- Application servers: Oracle WebLogic, WebCenter Spaces, WebSphere, OC4J, JBoss, and Tomcat
- Databases: Oracle 12c, Oracle11i, Oracle 10g, Oracle 9i, DB2, MySQL
- Software Tools: Eclipse, Together, Oracle JDeveloper, IntelliJ, Toad, PL/SQL Developer, XML
- COTS: Oracle SOA suite, Oracle Fusion Middleware 12C, Oracle Service Bus, Oracle BPEL and BPM, Oracle Identity Management, Oracle APEX, Salesforce (low-code, no-code)
- Operating Systems: UNIX (HP, SUN Solaris, and DEC), Linux, Windows
- Bigdata technologies: Apache Hadoop, Spark, Storm (Event Processing), Solr (Search Engine),
- DevSecOps tools: JIRA, GitLab, Jenkins, Artifactory, Ansible, Confluence, Kubernetes, Docker.

Experience

22nd Century Technologies Inc., Washington, DC. USA. | September 2015 – till date
Project Manager

- Oversee the overall execution and delivery of the AI Chatbot Solution Program ***(Currently Working for the Department of Labor)*** in alignment with the project's objectives and timeline.
- Serve as the primary point of contact between TSCTI and the client, ensuring effective communication and collaboration throughout the project lifecycle.
- Provide strategic guidance and direction to the project team, leveraging expertise in AI technologies and data modernization strategies.
- Manage project resources, including personnel, budget, and timelines, to ensure efficient and successful project delivery.
- Monitor project progress and performance, identifying and mitigating risks and issues as they arise.
- Foster a culture of excellence and innovation within the project team, encouraging creativity and continuous improvement.
- Ensure compliance with industry standards, regulations, and best practices in all project activities.

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- Report regularly to key stakeholders on project status, achievements, and challenges, and facilitate decision-making as needed.
- Drive the adoption of agile methodologies and best practices in project management to optimize project outcomes.
- Facilitate knowledge transfer and documentation of project learnings for future reference and improvement.
- Currently serving as a Solutions Architect for diverse Oracle DB/Fusion MW/Cloud projects at the U.S. Department of Labor.
- Orchestrating environments on hosted cloud platforms for multiple Oracle projects within the organization.
- Employing AI/ML techniques to eliminate duplicates from the Salesforce Application (OSHA Safe & Sound).
- Leading the modernization of a legacy Software build System for CI/CD/CD DevOps implementation using Jenkins, GitLab, Oracle WLS, Oracle DB, and Splunk.
- Spearheading the login.gov projects to establish a unified Identity and Access management system for OSHA/DOL.
- Pioneering the Salesforce practice at OSHA and advancing the modernization of a pilot application (SPA).
- Successfully implementing Login.Gov for a mission-critical OSHA application – Injury Tracking Application, recording 300,000 submissions for FY-2023.
- Making substantial contributions during the migration of a 40-year-old legacy data system to Oracle Database, leveraging AI-driven strategies.
- Analyzing and mitigating vulnerabilities through AI approaches, addressing issues like insecure deployments, cross-site scripting in Oracle ADF applications, and cookie security.
- Initiating the DevSecOps practice at OSHA by harnessing AI capabilities through DOL shared services.
- Actively evaluating AI-driven products like JIRA, GitLab, Jenkins, Artifactory, Ansible, and Confluence for use and deployment.
- Exploring modern architecture and AI-driven technologies such as React, Oracle-JET, Angular, and RESTful Services to build cutting-edge dashboards.
- Leveraging Oracle OAM/LDAP with AI enhancements for LDAP and Single Sign-On Capabilities across systems.
- Engaged in AI-driven JVM performance tuning, developing ad-hoc AI-powered tools for troubleshooting, and documenting comprehensive install/configuration guides.
- Architecting and migrating 21 mod_PL/SQL to Oracle REST data services with AI-powered methodologies, prototyping initially on Oracle DB and later porting to WebLogic Server 12.2.1.x.
- Pioneering the migration of a legacy data system (Mainframe-ADABAS) to Oracle DB 12.1.0.2, employing AI-driven scripts in shell/python for efficient data ingestion.
- Key involvement in a Hadoop/Big-Data project, utilizing AI to build a centralized Data Mart for 40+ years of legacy data, setting up AI-driven Big Data products like MongoDB, Hadoop, Pig/Hive, and experimenting with Oracle NoSQL for optimized performance.
- Deploying ADF 12c Applications on WebLogic Server-12c, incorporating AI methodologies for seamless integration.

Prior Experience

Client Name	Position	Duration
Apps Systems LLC. (US Securities and Exchange Commission)	Oracle Fusion Middleware Architect/Consultant	March 2015 - August 2015
Oracle Corporation Australia Pty Ltd.	Senior Applications Engineer	April 2006 – March 2015
Oracle Corporation India Pty Ltd.	Senior Member of Technical Staff	Dec 2003 – March 2006
HTC Global Services Inc.	Database Administrator/Consultant	Feb 2001 – Dec 2003

Sandeep Singh – Account Director

Sandeep Singh – Account Director (Availability 90%)

Brief Profile

An innovative and resourceful PMP-certified Account Director with strong experience of over 15+ years in handling practically all aspects of IT services and solution-related business. He possesses a deep knowledge of Federal, State, and local agencies and has strong experience in managing multi-year government contracts. Skilled in building and nurturing client relationships, leveraging strong communication and negotiation abilities to drive client satisfaction and business growth. Proficient in resource management, ensuring optimal allocation of personnel, budget, and technology to maximize project success. Adept at ensuring high-quality deliverables and adherence to industry standards, while proactively identifying new business opportunities to expand the organization's IT consulting services.

Education

- PGDIM, International Marketing, Clarendon Business College, 2001
- Project Management Professional (PMP)

Core Competencies

- Experience in handling practically all aspects of the AI Consulting Program related to business, with expertise in handling contracts.
- Managed teams as large as 50 people in size and up to 6 projects in parallel.
- Single point of contact for management-related communication and managing client engagements. Skilled in ensuring SLAs are met and taking corrective actions for issues identified.
- Single point of contact for all management-related communication. Act as Quality Manager and attend performance reviews and status meetings.

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- Understand the requirements of the qualified accounts/opportunities/clients, Firm up a unique value proposition addressing the opportunity, present the same to the decision-makers in the account, and negotiate and firm up the contract. Doing marketing research on prospects.
- Planning and subsequent coordination with VP sales for the development and implementation of quarterly and annual business plans relevant to consultancy services provided by the company.

Experience

22nd Technologies, Inc., Account Director | Feb 2012 – Present

During his time at TSCTI, he has been involved in various State and local government contracts. The portfolio includes clients such as Florida Retirement System, EDLINK, Superior Court of Los Angeles, US Department of Agriculture, Internal Revenue Service, Wayne County Airport Authority, Chicago Teachers' Pension Fund, Florida Department of Management Services, and more. Responsibilities include:

- Developing an overall strategy and plan for the IT consulting project, aligning it with the organization's objectives and client requirements.
- Building and maintaining strong relationships with clients, understanding their business needs, and providing strategic guidance and solutions to meet their IT consulting requirements. Managing and allocating resources effectively, including personnel, budget, and technology, to ensure the successful execution of the IT consulting project.
- Overseeing the quality of deliverables and ensuring that the IT consulting project meets or exceeds client expectations while adhering to industry standards and best practices. Identifying new business opportunities, networking with potential clients, and participating in business development activities to expand the organization's IT consulting services and drive growth.
- Oversee the technical architecture and design of the AI chatbot, ensuring it meets the client's requirements and integrates seamlessly with existing systems.
- Collaborate with technical leads and developers to ensure that the chatbot's natural language processing (NLP) and machine learning (ML) models are optimized for performance and accuracy.
- Coordinate with IT teams to ensure the chatbot's compatibility with the client's infrastructure, including databases, APIs, and third-party systems.

HCL, Process Manager | 2004 – 2010

- Worked with product leads to ensure requirements are gathered and clear for the appropriate teams.
- Ensured a consistent and shared understanding of best practices across teams and functions. Ensured standards for communications and reporting are being followed. Assisted with problems related to team member performance.
- Participated in the initial planning until work packages or activities are assigned.

Telefocus Communications, Field Manager | Aug 1999 – Feb 2004

- Managed a team of 6-18 field interviewers on an assigned project, as well as for all project field data collection tasks within a geographical region. Assisted with interviewer recruiting tasks, writing, and reviewing project materials, mentoring the interviewing staff, and other relevant tasks as directed by the Regional Manager.
- Supervised Field Interviewers and their data collection activities, including weekly calls in which costs and production were reported and discussed.

Ravindra Shukla – Enterprise AI Architect

Ravindra Shukla – Enterprise AI Architect (Availability 100%)

Brief Profile

Enterprise AI Architect with 20+ years of experience designing and delivering AI/ML, Generative AI, and Big Data platforms across healthcare, life sciences, financial services, and hi-tech. Expert in enterprise-scale AI architecture, NLP/LLMs, predictive modeling, and cloud-native platforms. Proven leader in implementing AI governance and ethical AI frameworks, building secure ChatGPT-like systems, and architecting solutions that drive measurable impact in clinical, commercial, and regulatory domains. Recognized for combining deep technical expertise with strategic leadership to deliver scalable, secure, and business-aligned AI systems.

Education/Publications

- Bachelor of Technology (Civil Engineering) – Indian Institute of Technology (IIT Bombay), 1993
- Best Paper Award, PCCDS 2021 – AI NLP research in extractive/abstractive summarization
- Speaker, PHUSE 2024–2025 – Clinical Protocol Optimization with GenAI, AI Strategy for Executives, Empowering Healthcare through GenAI
- Publications – White papers on Prescriptive Recommender Systems & Global Distributed Data Architecture
- Continuous corporate and professional training (PwC, IBM, SAP, Centurylink, Syneos) in AI/ML, Cloud, Big Data, IoT, and Enterprise Architecture

Tools & Technologies

- **AI/ML & GenAI:** GPT-4 series (4, 4o, 4 Turbo), O1/O3 models, Claude 3.7, Google Gemini 2.0, Llama 3.2, Snowflake Cortex, Hugging Face, LangChain, BioBERT, Transformers, LSTM, SVM, Random Forest, Isolation Forest, K-means++
- **Cloud Platforms:** AWS (Bedrock, GuardDuty, Lambda, S3), Azure (OpenAI APIs, Data Lake, APEX), GCP (Vertex AI, Gemini), Hybrid/Multi-Cloud Architectures
- **Big Data & Data Platforms:** Hadoop, Spark, Kafka, Hive, Cloudera, HANA, Data Lakes/Warehouses, ETL frameworks

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- **Enterprise Architecture & Security**: Service-Oriented Architecture, Microservices, API-first design, OAuth, Intrusion Detection/Prevention, Open Policy Agent
- **Analytics & Visualization:** Tableau, Power BI, SAP Lumira, Quicksight, Advanced KPI/BI dashboards
- **Programming & Tools**: Python, Java (Spring Boot), SQL, Docker, Kubernetes, Mulesoft

Experience

TSCTI – Lead Enterprise AI Architect | Jun 2025 – Present

- Define and drive TSCTI's enterprise AI architecture vision, aligning with organizational goals and client digital transformation strategies.
- Establish AI/ML/GenAI adoption frameworks, covering technology stack selection, cloud strategy, and integration with legacy enterprise systems. Ensure AI systems meet performance, reliability, security, and compliance requirements.
- Architect and oversee development of scalable AI/ML platforms, including Generative AI, Classical ML, NLP, and Computer Vision solutions.
- Lead design of data pipelines, data lakes, and real-time analytics systems across multi-cloud (AWS, Azure, GCP) and hybrid environments.
- Serve as the technical authority for multiple AI engagements across the public sector, healthcare, financial, and high-tech clients.
- Collaborate with delivery teams to translate business requirements into AI-enabled solutions, ensuring cost-effective and timely execution.
- Drive use case identification, POCs, and production rollouts for advanced analytics and GenAI applications.
- Establish AI governance frameworks for bias mitigation, explainability, and responsible AI usage.
- Author AI policies and compliance guidelines for federal and state government clients, ensuring adherence to data privacy and regulatory standards.
- Engage with client CXOs, IT leaders, and business stakeholders to present AI solution architectures, ROI models, and future-state roadmaps.
- Represent TSCTI in AI advisory boards, conferences, and industry forums, contributing to thought leadership on enterprise AI adoption.
- Lead and mentor a team of AI architects, data scientists, and engineers, fostering a culture of innovation and excellence.
- Build internal Centers of Excellence (CoEs) for AI/ML, Generative AI, and Big Data to standardize best practices and accelerate delivery.
- Architecting GenAI-driven citizen services platforms for government agencies, enhancing accessibility and reducing service turnaround.
- Leading fraud analytics and anomaly detection solutions for healthcare payors, integrating advanced ML models for billing and claims monitoring.
- Designing intelligent document processing pipelines (NLP + GenAI) for public records and case management automation.
- Implementing predictive maintenance and risk analytics platforms in transportation and manufacturing client environments.

Syneos Health, NY | Managing Director – AI & Advanced Analytics | Nov 2019 – Jun 2025

- Designed and led the Enterprise Generative AI Platform, integrating cloud-native, secure, and scalable solutions adopted across clinical, commercial, and regulatory units.
- Architected protocol optimization and authoring systems leveraging NLP/GenAI for faster, patient-centric clinical trial design.
- Directed development of secure ChatGPT-like enterprise platform, supporting 3,000+ users with role-based access and data privacy controls.
- Built advanced AI systems: Adverse Event Detection, Medical Coding automation, Disease Ontology engines, HCP Insights platforms, Neuro-Image Analytics, and e-TMF classification.
- Authored and implemented the AI Policy & Governance framework, ensuring compliance, ethical use, and regulatory alignment of enterprise AI deployments.
- Tech Environment: Azure OpenAI, AWS Bedrock, GCP Vertex AI, Hugging Face, LangChain, BioBERT, Transformer models, Hybrid cloud architecture.

Incedo Inc., San Jose, CA | Vice President – Big Data & Advanced Analytics | Aug 2018 – Nov 2019

- Architected financial data-sharing platform (AWS-based, microservices, OAuth) enabling secure inter-firm data exchange with embedded fraud detection, IDS/IPS, and audit systems.
- Led Digital Conversion project for Verizon, designing AI/ML-driven funnel analysis and customer journey modeling to increase sales conversion.

Centurylink Cognilytics, San Jose, CA | Director – Big Data & Advanced Analytics | Apr 2013 – Aug 2018

- Led multiple enterprise-scale data lake and AI platform builds for global clients (Kimberly Clark, UHG, Kindred Healthcare, Memorial Healthcare).
- Designed predictive models for health score, readmission risk, sepsis detection, and patient engagement, integrating data from EHR, insurance, and IoT sources.
- Architected B2B Marketing Analytics platforms leveraging Spark ML, Hadoop, and in-memory HANA, supporting multi-touch attribution and prescriptive channel optimization.

Early Career – PwC, IBM, Silicon Graphics, TCS, Fresenius Medical, Novartis, J&J, Amgen

- Led enterprise architecture, BI/Analytics, and data platform modernization projects across healthcare, pharma, manufacturing, financial services, and hi-tech.
- Delivered end-to-end AI/BI/Cloud transformations, including UPS billing recovery, AMEX credit settlement, Facebook big data query optimization, and Novartis unstructured text analytics.

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Dr. Mohit Gambhir - Ethical AI Expert

Dr. Mohit Gambhir - Ethical AI Expert (Availability 100%)

Brief Profile

Recognized among the Top 300 Global Strategists by IAM, with over 24 years of experience in driving innovation ecosystems, scaling multi-million-dollar ventures, and shaping responsible adoption of advanced technologies. Known for leadership in Ethical AI, Responsible Innovation, and IP Commercialization, with extensive contributions to government, academia, startups, and Fortune 500 enterprises. Expertise spans AI, ML, IoT, blockchain, big data, cloud computing, and intellectual property frameworks, ensuring that technology is deployed with transparency, accountability, and societal impact. Expertise Areas

- Ethical & Responsible AI
- AI Policy & Governance
- Innovation Strategy & IP Commercialization
- Technology Foresight (AI, ML, IoT, Blockchain, Big Data)
- Academic-Industry-Government Collaboration

Education/Achievements

- Ph.D. in Computer Engineering – Jamia Millia Islamia, Delhi
- M.Tech (MS) in Computer Science & Engineering – GGSIP University, Delhi
- B.Tech (BS) in Computer Science & Engineering – Kurukshetra University
- LLB (JD equivalent) in Intellectual Property Rights – CCS University, Meerut
- Project Management Professional (PMP)
- Fostering Innovation and commercialization of intellectual property rights program: CBS Executive Fonden

Membership:

- Senior Member, IEEE (SMIEEE)
- Member, Licensing Executive Society (LES) USA & Canada
- Life Member, IACSIT & IAENG

Awards & Recognition

- Global Leader in Innovation & Entrepreneurship – Harvard University Global Systems
- DSI Distinguished Visitor Award 2019 – Dayanand Sagar University, Bengaluru
- Multiple recognitions for ethical innovation leadership from government, academia, and industry bodies.

Tools & Technologies

- AI/ML: Python, R, TensorFlow, PyTorch, Scikit-learn, MATLAB
- Analytics & Data Platforms: SQL, NoSQL, Hadoop, Spark, Power BI, Tableau
- Cloud: AWS, Microsoft Azure, Google Cloud Platform
- IoT & Edge: Arduino, Raspberry Pi, MQTT, Node-RED
- Blockchain: Hyperledger Fabric, Ethereum, Solidity
- IP & Research Tools: PatSnap, Questel Orbit, Derwent Innovation, USPTO/EPO/WIPO Databases
- Collaboration & Agile Tools: Jira, Confluence, Miro, Mind Mapping, Design Thinking

Experience

Sr. Ethical AI Expert | Aug 2024 – Present
22nd Century Technologies Inc. (TSCTI), USA

- Direct growth strategy across the State, Local, and Education (SLED) market by implementing AI/ML, IoT, blockchain, and big data solutions.
- Establish Responsible AI governance frameworks for government clients to ensure ethical deployment of advanced technologies.
- Develop roadmaps for cloud-first, data-driven modernization, integrating AI with legacy government systems.
- Oversee cross-functional teams delivering AI-powered citizen services, predictive analytics, and operational efficiency models.
- Establish and lead the Ethical AI & Responsible Innovation practice across Federal and SLED engagements.
- Develop and implement AI governance policies ensuring compliance with NIST AI Risk Management Framework, EU AI Act, and Federal AI standards. Oversee design and deployment of responsible AI-enabled solutions for education, public safety, healthcare, and citizen services.
- Guide cross-functional teams on bias detection, explainability, privacy-preserving AI, and data accountability.
- Support proposal development and solutioning by positioning TSCTI as a GovCon leader in Ethical AI adoption.
- Represent TSCTI in national and international AI ethics forums, conferences, and government advisory committees.
- Mentor internal teams and client stakeholders in responsible innovation, IP strategy, and ethical technology commercialization.

President | Dec 2014 – Aug 2024
Verispire Consulting Corporation, USA

- Built and scaled a consulting practice specializing in IP due diligence, FTO analyses, and technology landscape studies.

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- Designed IP commercialization frameworks aligned with responsible technology adoption principles.
- Advised startups, R&D labs, and investors on ethical innovation strategies and patent portfolio management.
- Supported Fortune 500 companies in integrating responsible AI and IP compliance measures within digital transformation initiatives.
- Delivered thought leadership on ethical innovation through publications, workshops, and advisory panels.

Innovation Manager (Consultant) | Nov 2023 – Aug 2024
University of Maryland – UM Ventures
- Evaluated invention disclosures and assessed commercialization potential with emphasis on social and ethical impact.
- Structured IP licensing agreements ensuring fair value distribution and responsible innovation transfer.
- Collaborated with faculty researchers to align AI and MedTech innovations with ethical deployment standards.
- Advanced university–industry partnerships to promote AI governance and responsible technology adoption.

Adjunct Professor of Practice (Innovation & IP) | Mar 2023 – Feb 2025
IIT Jodhpur (India)
- Founded the Center of Excellence in Innovation & IP, advancing research in MedTech, AI ethics, and social innovation.
- Guided academic researchers, MSMEs, and artisans on ethical IP creation, technology licensing, and responsible commercialization.
- Developed academic frameworks promoting responsible innovation practices in technology transfer and entrepreneurship.
- Designed and delivered curriculum on AI, ML, IPR, and innovation ethics for engineers and entrepreneurs.

Director (Innovation) | Aug 2018 – Jan 2023
Ministry of Education – Innovation Cell, Govt. of India
- Founded and scaled the national innovation ecosystem, transforming India's innovation landscape.
- Established 15,000+ Institute Innovation Councils to promote grassroots innovation with responsible technology use.
- Designed and launched KAPILA (IP Literacy Program) to enhance ethical innovation and IP awareness.
- Conceived and executed the Smart India Hackathon, embedding ethical AI problem-solving at a national scale.
- Launched YUKTI 2.0, accelerating academic innovations with a focus on AI ethics, social value, and sustainable impact.
- Partnered with ministries, universities, and corporations to shape national AI policy and innovation governance.

Founder & Co-CMD | Successful Exit | Oct 2015 – Dec 2016
Piverse, Inc. (USA, India, UK, Singapore)
- Expanded workforce from 12 to 100+ within one year, achieving profitability in record time.
- Delivered IT and innovation solutions with emphasis on ethical scaling and responsible technology adoption.
- Designed corporate governance structures to ensure fair AI adoption practices in client engagements.

Founder & Director | Successful Exit | May 2008 – Dec 2014
TecEsq Knowledge Solutions LLC, USA
- Built an international IP outsourcing practice specializing in patent searches, due diligence, infringement analysis, and patent prosecution.
- Supported law firms, corporations, and inventors with ethical IP advisory services aligned with global best practices.
- Implemented responsible IP lifecycle management frameworks for startups and global clients.

Sadiq Ahmed – Senior Consultant / Architect

Sadiq Ahmed – Senior Consultant / Architect (Availability 100%)
Brief Profile
Sadiq Ahmed is a highly accomplished Senior Consultant and Architect with over 20 years of experience in architecture, design, and development of enterprise-level applications and system integration solutions. He specializes in leveraging Microsoft and open-source technologies to deliver scalable, secure, and innovative solutions across domains such as Artificial Intelligence, Machine Learning, Cloud, Big Data, Mixed Reality, Finance, Healthcare, and Government services. He is proficient in C#, .NET, Azure, Python, Azure OpenAI, Unity 3D, and a wide range of modern frameworks and tools. His expertise extends to AI/ML solutioning, microservices, cloud-native applications, legacy system modernization, mixed reality, and enterprise architecture patterns. He has played key roles as a solution architect, technical strategist, and team leader, driving technology adoption aligned with organizational goals.
Education

• Master's in Computer Science (MCS)
• MIT Professional Certificate Program in Machine Learning & Artificial Intelligence
• MIT Certifications:
  ◦ Workplace Analytics, AI, and Ethics
  ◦ Deep Learning for AI and Computer Vision
  ◦ Reinforcement Learning (Foundation & Advanced)

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- Machine Learning for Big Data & Text Processing
- Microsoft Certifications:
  - Azure AI Engineer Associate
  - Azure AI Fundamentals
  - Azure Fundamentals
  - Azure Certified Developer
  - Build NLP solutions with Azure AI Language
  - Intelligent Document Processing with Azure AI Document Intelligence
  - Develop Generative AI Solutions with Azure OpenAI Service
- Other Certifications:
  - Microsoft Certified Professional
  - Certified Unity 3D Developer
  - Ethics and Law in Data and Analytics
  - Python for Data Science
  - Azure Quantum Workshop

Tools & Technologies

- **Cloud & AI**: Azure (AI, OpenAI, ML, Cognitive Services, AI Studio), AWS, Databricks, Azure Data Factory, Event Hub, Service Bus, Kubernetes, Docker, Azure Service Fabric
- **Programming**: C#, .NET (1.1 → 8), Python, TypeScript, C++, PowerShell, VB.NET, NumPy, Panda, PyTorch
- **Databases**: Azure SQL, Cosmos DB, SQL Server (2000–2019), Oracle, DB2, MySQL, MongoDB, Data Bricks
- **Frameworks & Platforms**: ASP.NET, Blazor, MVC, Web API, EF/EF Core, Angular, Aurelia, Unity 3D, HoloLens, Microsoft Dynamics, SharePoint, Power Platform
- **Architecture & Methodologies**: Clean/Onion, DDD, SOA, Microservices, CQRS, RAG Pattern, OOAD, Agile/Scrum, TDD, CI/CD, Azure Well-Architected Framework
- **Security & Identity**: OAuth2, OpenID Connect, Claims-based Identity, Azure AD, Key Vault, SAML, SSL VPN, Forensics, Veracode
- **Tools & Integration**: GitHub, TFS, Swagger/Open API, Visio, UML, O365, Power BI, Power Apps, Microsoft Flow

Experience

22nd Century Technologies, Inc. – Consultant (Architect / Sr. Lead Developer)
2016 – Present

- Architected and delivered AI/ML-powered solutions, including a price forecasting system using Azure ML and ML.NET.
- Designed and implemented RAG (Retrieval-Augmented Generation) solutions with Azure OpenAI for healthcare and retail domains.
- Developed bots leveraging Microsoft Bot Framework integrated with Azure Cognitive Services.
- Led modernization of legacy systems (Mainframe, ASP.NET apps) into Azure-based PaaS/SaaS solutions.
- Architected microservices hosted on Service Fabric and Docker/Kubernetes, integrated via Azure API Management.
- Implemented document intelligence solutions with Azure Form Recognizer, enhancing automation for document-heavy processes.
- Built Mixed Reality prototypes using Unity 3D and MRTK, integrated with AI & Cognitive APIs for immersive solutions.
- Defined and implemented Clean Architecture and Domain-Driven Design (DDD) across multiple enterprise applications.
- Championed DevOps practices, setting up CI/CD pipelines in Azure DevOps and leveraging Infrastructure-as-Code with ARM templates.
- Ensured security and compliance by implementing claims-based identity solutions, Azure Key Vault integration, and Veracode validations.

Environment: Azure, .NET, C#, Python, Azure AI/OpenAI, ML.NET, Angular, Unity 3D, SQL Server, Cosmos DB, Docker, Kubernetes, Microservices
End Clients: USPS OIG, USDA, Dignity Health, VBA, NRECA, Ryder, SES, City of New Orleans

Prior Experience

Client Name	Position	Duration
International Trade Administration (The MIL Corporation)	Solutions Architect	Jun 2014 – May 2015 (1 yr)
Enquizit, Trilogy (QuantumLeap Technologies)	President	Aug 2012 – May 2014 (1 yr 10 mos)
Norfolk Southern, Ford Foundation, Constellation, Hobsons (Digital Terrain Inc, acquired by HiDef Inc)	Architect	Aug 2010 – Jul 2012 (2 yrs)
Microsoft, TTX, Thomson Reuters (ITVertical Inc)	Architect / Sr. Developer	Aug 2008 – Jul 2010 (2 yrs)
Microsoft, Northern Trust (WWSS)	Architect / Sr. Developer	2007 – 2008 (1 yr)
CMA CGM	Application Architect	Jan 2007 – Apr 2007 (4 mos)
QL	Architect and Project Lead	Apr 2006 – Dec 2006 (9 mos)
IST	Architect and Project Lead	2004 – 2006 (2 yrs)
Uffaq	Architect and Project Lead	Aug 2002 – Jun 2004 (1 yr 11 mos)
NeoVision (Pvt) Ltd	Developer	May 2001 – Jul 2002 (1 yr 3 mos)
IST	Developer	Feb 2000 – Feb 2001 (1 yr 1 mo)

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Thiruthuvadas (Thiru) Kanagaraj – Senior Solution Architect / AI Architect

Thiruthuvadas (Thiru) Kanagaraj – Senior Solution Architect / AI Architect (Availability 100%)

Brief Profile

Thiruthuvadas Kanagaraj is an accomplished Senior Solution Architect and AI Architect with over 25 years of expertise in enterprise architecture, cloud transformation, AI/ML, Generative AI, large language models, security, and distributed systems. He has extensive hands-on experience in designing and implementing solutions across Azure, AWS, GCP, and on-premises environments, with deep technical skills in microservices, Kubernetes (AKS/EKS/GKE), AI/ML pipelines, automation, and secure architectures. He has led complex federal, state, and enterprise programs across domains including defense, tax & finance, law enforcement, utilities, healthcare, telecom, and eCommerce. His technical leadership spans system rationalization, cloud migrations, modernization of legacy systems, secure AI adoption, and enterprise architecture frameworks (TOGAF, DoDAF, Arc42, UAF). He is also experienced in team building, global delivery, compliance (FedRAMP, HIPAA, CJIS, DoD ATO), and proposal support..

Education

- Master's in Computer Applications (equivalent to MS in the USA) – Bharathidasan University, India
- Bachelor's in Physics – Bharathidasan University, India
- Certifications:
  - Security+ Sys 600 (2022)
  - VMware VSP Foundation (2021)
  - UiPath Certified (2020)
  - Java Certified (2005)
  - MySQL AB Certified (2004)

Tools & Technologies

- **Cloud Platforms**: Azure, AWS, GCP, Oracle Cloud, IBM Cloud
- **AI/ML:** Generative AI, LLMs (Ollama, Gemma), PyTorch, TensorFlow, Keras, OpenCV, SageMaker, Azure AI, Vertex AI, UiPath AI, Azure AutoML, GANs/VAEs, OCR (CRAFT, Tesseract, Azure Form Recognizer)
- **Programming & Frameworks:** Java (JEE, Spring Boot, Quarkus), NET/C#, Python (Flask, Django), Scala, PHP, React, Angular, Node.js, GraphQL, PowerApps
- **Containers & Orchestration:** Kubernetes (AKS/EKS/GKE), Docker, Istio, ArgoCD, Helm, Terraform, Ansible, CDK, Jenkins, Spinnaker
- **Databases**: Oracle, SQL Server, Postgres, MySQL, Informix, Couchbase, MongoDB, Snowflake, Databricks
- **Architecture & Methodologies:** TOGAF, DoDAF, Arc42, UAF, Microservices, Event-Driven Systems, Zero Trust Architecture (ZTA), DevSecOps, CI/CD pipelines, IaC
- **Security & Compliance**: FedRAMP, DoD ATO, NIST 800-53, DISA STIG, HIPAA, CJIS, SOC2, ACAS/HBSS, eMASS, WAF, Identity & Access (Azure AD, Okta, SAML, OAuth2, PKI)
- **Visualization & Tools:** Power BI, Grafana, Prometheus, Mimir, Visio, Cameo, Rational Rose, JMeter, Selenium, Appium

Experience

US Navy | Enterprise Architect (Representing TSCTI)
Jun 2024 – Present

- Architected System Facts AI Query System using Ollama3.3 and Gemma LLM, enabling knowledge base queries for MyNavy HR.
- Designed and migrated 40+ systems to AWS Cloud with Terraform and Ansible automation.
- Created the TSCTI AI-based System Rationalization Framework, similar to SAP LeanIX, for system decommissioning.
- Developed DoDAF artifacts (OV1, CV2, SV1, AV1) using Cameo & Unicom tools.
- Implemented Agentic AI & MCP for AWS IaC provisioning.
- Led ARW/ASR reviews for 60+ Navy systems; automated processes with PowerApps, UiPath, Java Spring Boot, and React.
- Received "Bravo Zulu" award twice in 10 months for outstanding performance.

IRS | Senior Solution Architect (Representing TSCTI)

- Designed unsupervised learning systems for tax form (1040, 941, 940, etc.) processing, leveraging PyTorch, GPU acceleration, and clustering algorithms.
- Architected computer vision pipelines for form field detection (TIFF/JPEG).
- Implemented Agentic AI with MCP for automated API generation, UI mockups, and training dataset creation.
- Scaled handwritten document processing from 10K to 100K/week using Kafka, AWS Fargate, and Redis.
- Designed EaaS (Extraction-as-a-Service) for secure file handling.
- Implemented SIEM solution with AWS Opensearch, Firehose, and Kinesis for FedRAMP compliance.
- Led FedRAMP audit success in 30 days, achieving IRS security clearance.

FBI & MA Police | Senior Solution Architect

- FBI: Architected Vetconnex Fingerprinting System; designed AI-based OCR solutions and automated VM failover with Terraform/Ansible.
- MA Police: Developed an AI anonymization solution for 911 narratives using spaCy and Rust; designed CJIS-compliant systems on EKS.

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USACE | Senior Solution Architect (Jan 2024 – Jun 2024)
- Built Python-based ETL architecture integrating AWS S3, Oracle, and Netezza.
- Designed AWS Glue pipelines, EventBridge triggers, and Lambda automation.
- Used Generative AI (GANs/VAEs) to produce synthetic datasets with SageMaker & Databricks.

Kaiser Permanente | Senior Solution Architect (Apr 2023 – Jan 2024)
- Designed Consumer Data Platform (CDP) using Azure Databricks, IICS, Synapse, Snowflake.
- Architected Paid Media Data Lake with AWS S3, Redshift, BigQuery, and Power BI.
- Led mainframe-to-microservices migration, implementing Spring Boot microservices secured with Azure AD.
- Developed Digital Asset Management integrating OTMM, AKS, and Adobe Creative Cloud.
- Ensured HIPAA compliance, PHI/PII protection, and DevSecOps integration.

Prior Experience
- OM Group Inc (2019–2023) – Principal Infrastructure Architect for Salesforce, AFWERX (USAF), J&J, HQDA-G9 modernization projects; delivered AKS/EKS clusters, ZTA, AI/ML solutions, and containerized architectures.
- National Grid (2018–2019) – Security & Solution Architect for MFA enablement, IAM, and network segregation.
- QVC (2018) – Architected secure eCommerce microservices using Spring Cloud, Angular, Couchbase.
- Biogen Idec (2017–2018) – Architected HIPAA-compliant REST API platform for pharma product Zinbryta.
- GE Digital (2017) – Migrated legacy apps to microservices; IoT AWS integrations.
- AllState (2017) – Migrated ADF REST APIs to Spring REST with OAuth2.
- Parexel (2008–2016) – Principal Software Engineer; led clinical trial software development across global teams.
- Earlier Roles (1999–2007) – Senior Developer & Architect roles with Sallie Mae, GSA, Expotel, QX Systems, Compsoft.

Radhakrishnan Nallamuthu – Data Scientist

Radhakrishnan Nallamuthu – Data Scientist

Brief Profile

Accomplished Senior IT professional with a background in business intelligence, software design and full life-cycle development. Capable of managing numerous projects while leading cross-functional teams to meet and exceed overall IT initiatives. Demonstrated consultative process skills with emphasis on written and relationship development skills. Highlights of skills: Business Intelligence, HANA Modelling, Data Warehousing/Data Modelling, Data Provisioning

Education
- B.S. Computer Science, Bharathiar University, India.
- Certifications: Certified HANA Professional, HANA Software Development

Tools & Technologies
- **Business Intelligence:** SAP BI 4.x/XI3.x/XI2.X/6.5, Crystal Reports, BI Explorer, SAP HANA, BI Mobile, Design Studio, Lumira Discovery/Designer, Information Steward 4.x, Dashboards 4.0/xCelsius, Analysis for MS Office/Excel/OLAP, Information Design Tool (IDT)/Universe Designer, Web Intelligence, Fiori, SAPUI5, Spotfire, Tableau, QlikView and BOBJ SDK (Java and Restful).
- **Databases:** Teradata 8.5/12, IBM DB2/400, SQL Server 2008/2005, Oracle 10g, Epic Clarity, Netezza, ServiceNow.
- **ETL Tool:** SAP Business Objects Data Services 4.x/Data Integrator, Informatica, DataStage, SSIS, SSAS, SSRS, Talend
- **ERP:** SAP ECC 4.7, 6.0, BW 7.1, SAP IS-U, S/4 HANA Simple Finance
- **Big Data:** Hadoop Hive, Sqoop, Spark SQL
- **Data Modelling:** Erwin, SAP Power Designer
- **Other Tools:** Attunity, Python

Experience

22nd Century Technologies, Inc. - Texas Department of Information Resources
Data Scientist (Big Data Engineer) May 2021 – Present
- Performs advanced (senior-level) data science work.
- Work involves gathering, analyzing, and managing large-scale healthcare data sets to guide key business decisions and model various market conditions in order to provide information for special projects or reports.
- Also involves designing and constructing new processes for data modeling and production using prototypes, algorithms, predictive models, and custom analysis.

xTerraBI LLC, Dallas, TX (May 2014-2021)- Data Engineer- HANA/BODS/BOBJ/HADOOP
Mercy Healthcare, St. Louis, MO
- Extracted the Epic clarity data into HANA and Hadoop for data analysis and analytical reporting through HANA Data provisioning Agent. Configured/Migrated the SDA/SDI remote data source to HANA Data Provisioning Agent. Upgraded the HANA database from 1.0 to 2.0 SP3

and implemented HANA dynamic tiering with multi-tenant database. Converted HANA Catalog roles into repository roles, migrated to QA and Production as delivery unit method, Implemented SAML authentication with BI 4.2 SP5 and Analysis for Excel. Migrated script view into Table functions and used by calculation view. Created and deployed various SSIS packages facilitating data pipelines for various reporting platforms. Developed Hana information model for Virtual care center, Patient, Optum and used by Lumira, Xcelsius and BI Tools (Crystal reports and Webi).

- Responsible for managing BODS Interface BODS validation Jobs from initial design to final
- implementation and deployment.
- Extracted the Optum data through web services using BODS Python script for further analysis with Government data.

Aviall Inc (A Boeing Company), Dallas, TX

- Architected the data mart solution for SAP Material part applicability project. Implemented Kimball data modelling (physical and logical model) for Materials and other related components using Erwin. Extracted SAP material related information using BODS and applied the transformation, loaded into data mart for reporting solution (Spotfire, BusinessObjects and Design Studio/Lumira Designer/Lumira Discovery).
- Extracted the SAP data into Hive using Smart Data Integration (SDA) and analyzed the data performance.
- Developed HANA Information views for customers sales orders to planning and purchasing through SAP ECC and SAP EWM.
- Developed data quality scorecards for SAP Master data, data profiling on raw material data and address data quality issues using Information steward/BODS.

Treehouse Foods, Oak Brook, IL

- Replicated SAP Material related tables for Procurement planning from ECC to HANA using SAP SLT. Forecasted the price variances over the next 24 months based on scenarios which define rates of raw materials (Extractors data) used for producing finished products. Allocated unassigned spend for Purchase/Freight order, do the Bill of Material explosion. Transform, cleanse the NON-SAP System (Lawson, CAINS, JD-Edwards and Sim Pro) data into SAP structure.
- Configured the Non-SAP data sources (13 systems) as remote data source using HANA SDA/SDI.
- Design (modeling) and construction of HANA and ECC structure tables, functions, procedures, and views using a combination of Data Services and HANA Studio. Developed HANA information modelling on top of these tables for Business user to do further forecasting analysis.
- Developed and developed procurement data quality package using Information Steward cleansing package builder and used in data services for data quality. Uploaded encyclopedia data for material using Information steward. Extracted the master data, data profiling, cleansing, identifying duplicates, consolidating and validating data and executing data loads from SAP and Non-SAP source to MDM using BODS.

ATMOS Energy, Dallas, TX

- Upgraded SAP BusinessObjects from 4.0 to 4.1 SP2 in clustered environment. Implemented BusinessObjects best practices for security, backup of BOBJ contents and promotion management. Led report development effort, including creation of many Crystal, Web Intelligence reports and universes. Analyzed existing Oracle BI reports for energy supply division, convert these requirements into universe and corresponding Crystal and Web Intelligence Reports.
- Executed technical leadership on the use of the technology platform and tools, mentoring in optimal use of BODS in a SSIS, SAP, and windows environment.
- Developed lease design studio dashboards and Webi reports against BW data.

Lands' End, Dodgeville, WI

- Acted as systems/software engineer for Business Objects architecture planning, technical design, development and testing, and software, hardware, and interface integration. Installed and Migrated the BOBJ 3.0 into BI 3.1 SP7 for extended life of Desktop Intelligence.
- Converted existing desktop intelligence reports data source from DB2 to Netezza.

Parkland Hospital, Dallas, TX

- Development of Conceptual, Logical and Physical database designs for Epic Clarity patient information. Source-to-Target data mappings for data provisioning of Patient EMR Data. Full lifecycle project focusing on patient diagnosis and procedural information, including Data Services and Designer (universe) components.
- Completed a review of best practices for both SQL and SSIS after an initial knowledge transfer
- Installed and Configured Microsoft SQL Server Management Data Warehouse for Performance Metrics and Analysis for Data Warehouses.
- Installed, configured Information Steward with BOBJ environment and integrated with other data sources. Developed data quality reports, validated and submitted into government data validation.

Prior Experience

- Fusion Consulting, Irving, TX (April 2010 - May 2014) – Sr. Consultant - HANA/BODS/BOBJ
- YARDI Systems (ARGUS Software), Dallas, TX (February 2003- April 2010) – BOBJ/BODS Developer
- BROOKS-PRI Automation, Fremont, CA (November 2002- January 2003) – BOBJ Developer
- AT &T Inc. (Cingular Wireless), Dallas, TX (August 2002- November 2002) – BOBJ Consultant .

Budget Template (Attachment C)

Attached Separately in excel spreadsheet.

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Experience and References

- ***Three examples of work previously performed by the Respondent that are substantially similar to the Services.***

TSCTI has over 28+ years of experience in delivering advanced technology solutions, with a specific focus on AI consulting services for various government agencies. We have consistently provided solutions that meet the needs of public sector clients, ensuring robust functionality, compliance with industry standards, and seamless integration with existing systems. Our long-standing relationships with government clients are a testament to our ability to deliver reliable and effective solutions that meet the stringent requirements of the public sector. ***Below, we have detailed our relevant case studies:***

Our Recent Contracts:

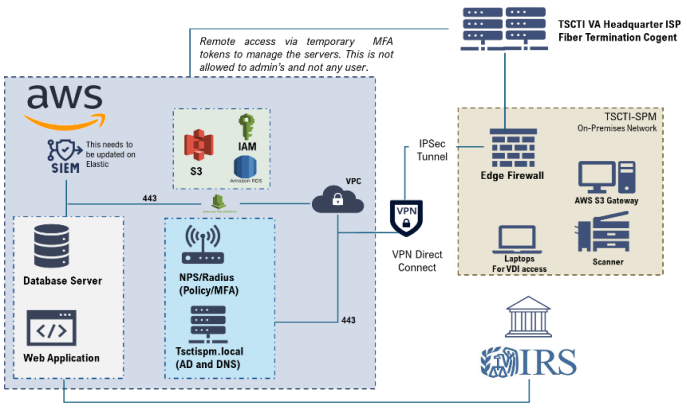
- ***Georgia Technical Authority, GA:*** TSCTI has been awarded a contract with GTA to support its Innovation Laboratory initiative, focusing on AI and emerging technologies to drive innovation and align with strategic goals. Planned deliverables include automation solutions like RPA and AI assistants, advanced communication tools such as chatbots, and AI-powered knowledge management. TSCTI will also implement data analytics and business intelligence to enable predictive insights and support decision-making
- ***State of Minnesota***: AI Readiness, AI strategy and roadmap development, Responsible AI policy development, Implementation and support services, AI training and support service
- ***Arizona Department of Administration:*** Artificial Intelligence and GenAI technologies Consulting, Architecture, Support and Development

➢ ***Internal Revenue Service***

Client: Internal Revenue Service	Contract Title: AI and ML Services	Contract Duration: 2023 - Ongoing

Scope: The scope of the project encompasses the modernization of submission processing for the IRS, specifically focusing on the receipt, sorting, and processing of mail, including tax returns, correspondence, and remittance. This modernization involves the implementation of advanced technologies such as machine learning, OCR (Optical Character Recognition), and digitization to streamline the handling of large volumes of mail. The project aims to improve accuracy, speed, and efficiency while adhering to IRS policies and timelines. Additionally, the scope includes interfacing with existing IRS systems and complying with cybersecurity requirements.

Delivery: The delivery of the project involves the *development and deployment of a comprehensive solution named "XtractIQ"* to automate various aspects of mail processing. This includes sorting, opening, extracting contents, identifying remittance, digitizing envelopes and content, and integrating with IRS systems. The solution utilizes advanced machine learning models tailored to IRS data characteristics, OCR tools for converting scanned forms into machine-readable text, and frameworks like Flask or Django for deployment in IRS production environments. The delivery also includes providing a user-friendly interface for human review and correction of data, as well as continuous monitoring of model performance.



With a proven track record of delivering innovative solutions for large-scale data processing challenges, TSCTI is well-positioned to meet the unique requirements of the IRS Submission Processing Modernization initiative. The team at TSCTI comprises highly skilled data scientists, engineers, and software developers who possess deep domain knowledge in machine learning, OCR technologies, and data analytics. TSCTI's advanced machine learning models are specifically tailored to address the complexities of IRS data, ensuring high accuracy and efficiency in document processing. The utilization of cutting-edge OCR tools, such as AWS Textract, demonstrates TSCTI's commitment to leveraging the latest technologies to enhance document digitization capabilities. Additionally, TSCTI's expertise in deploying solutions in production environments, using frameworks like Flask or Django, ensures seamless integration with existing IRS systems. Furthermore, TSCTI's proactive approach to monitoring model performance, utilizing tools like TensorBoard and the ELK Stack, underscores its dedication to delivering reliable and robust solutions. By continuously optimizing algorithms and workflows, TSCTI ensures that the project remains aligned with IRS policies and timelines while driving continuous improvement in processing efficiency.

Schedule: The project is aligned with the IRS Submission Processing Modernization (SPM) Scanning and Enterprise Digitalization Initiative, to achieve paperless processing by 2025 in support of initiatives related to the IRS Inflation Reduction Act (IRA). The timeline for the project involves the development, testing, and deployment phases, with regular milestones to track progress. The schedule also includes compliance with IRS policies and timelines for processing mail and ensuring that the solution meets the specified accuracy requirements.

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Resources: The project requires a multidisciplinary team with expertise in machine learning, data extraction, OCR technologies, software development, and cybersecurity. Resources include data scientists, engineers, software developers, cybersecurity specialists, and project managers. Additionally, the project may involve collaboration with external vendors for specialized technologies or expertise. The team will leverage tools such as Apache Hadoop, Apache Spark, TensorBoard, and the ELK Stack for data processing, monitoring, and analysis.

Results: The expected results of the project include significant improvements in accuracy, speed, and efficiency in mail processing for the IRS. This includes achieving 98%+ accuracy in identifying typed, printed, and handwritten text from complex documents and forms. The project aims to reduce data entry errors, streamline document processing workflows, and provide valuable insights for decision-making. Features of our solutions:

- ✓ XtractIQ is a comprehensive intelligent document processing solution, focusing on enhancing and simplifying document digitization processes.
- ✓ Supports various file types: PDFs, scanned images, etc.
- ✓ Image cleanup: De-skewing, noise reduction, rotation
- ✓ Uses AI/ML, NLP, or rule-based classification
- ✓ Excellent handwriting recognition
- ✓ Human-in-the-loop (HITL) review for low-confidence fields
- ✓ Integration: Produced quality output that any system can consume easily
- ✓ XtractIQ can proficiently process millions of diverse documents daily with any scanner
- ✓ Multi-channel input: FTP, scanners, cloud storage
- ✓ Automatically identifies document type
- ✓ Leverages machine learning, NLP, and pattern recognition
- ✓ Auto-validation using business rules
- ✓ Human-in-the-loop (HITL) model ensures reliable validation
- ✓ Role-based access control
- ✓ Dashboard for tracking document volumes, KPIs on processing time accuracy, etc.

➢ ***Office of Personnel Management***

Client: Office of Personnel Management	Contract Title: Information Technology Help Desk	Contract Duration: 2020 - Ongoing

Client Background: The Office of Personnel Management (OPM) was seeking IT help desk and technical support services for six different locations in DC, GA, PA, KS, FL, and VA to modernize its operational infrastructure and end-user computing devices. Seeking an enterprise-wide IT Help Desk solution, OPM aimed to efficiently manage its operating environment, provide technical support, and streamline service requests. The project encompassed establishing a 24x7x365(366) IT Help Desk Call Center, along with on-site technical support services. This comprehensive solution aimed to serve as the primary point of contact for all IT and security service requests, addressing hardware and software-related issues, password resets, troubleshooting, fault isolation, and hardware maintenance. OPM was undergoing a major IT transformation, transitioning from physical Data Centers to cloud-based services, utilizing Microsoft technologies, including Office 365, Microsoft Teams, and Windows operating systems. OPM operated HP Laptops running Windows 10 21H2, with plans for an upgrade path to Windows 11. The agency was also shifting from traditional VPN to a Zero Trust Networking (ZTN) solution and adopting cloud-based services for improved efficiency.

Solution & Services Provided: TSCTI, the selected sole contractor for the Office of Personnel Management (OPM) Office of the Chief Information Officer (OCIO), offers an extensive and adaptive solution tailored to meet the evolving IT needs of OPM. The core of TSCTI's approach revolves around an externally hosted 24x7x365 IT Help Desk Call Center, functioning as the primary contact point for all IT and security service requests. This includes on-site technical support services aligned with OPM's core hours and requirements, ensuring a responsive and adaptive support system. The tiered support model, ranging from Tier 1 to Tier 4, ensures a structured approach to addressing issues. Tier 1 focuses on first-call resolution, with skilled staff handling initial requests. Tier 2 involves in-depth troubleshooting and technical analysis by experts familiar with OPM's core products, while Tier 3 engages top subject matter experts for expert-level support. Tier 4 brings in external support teams for specialized services not covered by the IT Help Desk. On-site technical staffing is provided in accordance with OPM's hours, covering computing devices, asset management, and access control technical services. TSCTI's commitment extends to end-to-end technical support for local, remote, domestic, and international OPM system users. The contractor supports OPM IT assets both centrally located and remotely, ensuring a comprehensive approach to technical support. Integration with OPM's existing IT Service Management System (ITSM), BMC Remedy, is a critical component. TSCTI ensures seamless tracking and visibility of all Help Desk requests, with a commitment to providing a two-way real-time interface and data exchange if a different ITSM solution is employed. This emphasizes the contractor's adaptability and commitment to aligning with OPM's established processes.

To further enhance user experience, TSCTI implemented self-service features, including the deployment of a chatbot. Users interacted with the chatbot to create tickets for resolution, and our team efficiently used this virtual assistant. The chatbot, which is equipped with advanced natural language processing skills, exhibited its talents by responding quickly and accurately, resulting in a seamless and human-like encounter. This smart chatbot proved beneficial in automating regular operations, easing issue tracking, and improving the overall efficiency of the Help Desk workflow. It served as a virtual assistant, not only answering customer questions and troubleshooting issues, but also offering advice on common problems. TSCTI enhanced this foundational model by integrating several advanced tools and customizations. AWS Kendra was used to create a dynamic knowledge base, allowing the chatbot to access and deliver accurate information from a

repository of over 10,000+ IT support documents. The user interface for the chatbot was developed with ReactJS, ensuring a responsive and intuitive experience across both web and mobile platforms. The chatbot, deployed with AWS Lex, was designed to handle up to 2,000 simultaneous user interactions and automated over 60% of routine support tasks, such as ticket creation and initial issue diagnosis. This customization significantly improved the speed and accuracy of issue resolution, contributing to a reduction in average ticket resolution time by 35% and enhancing overall help desk efficiency. Integrated with a knowledge base, the chatbot quickly accessed and communicated relevant information, dramatically improving ticket resolution.

TSCTI also provides a strong AI governance framework, assuring responsible AI practices, data protection, and security, as well as avoiding possible hazards like AI model bias. We created an AI policy for OPM that was consistent with its strategic objectives, concentrating on complete risk assessment and ethical compliance. Furthermore, our monitoring and evaluation system was integrated to track the efficacy of AI implementation across multiple processes. TSCTI, dedicated to our service delivery processes, developed a comprehensive AI training curriculum for OPM workers that covered AI basics, data analysis, and machine learning. Hands-on experience with AI tools, as well as ethical issues, was critical in ensuring that employees could effectively implement AI solutions. This training program promoted a data-driven culture by allowing staff to identify process improvements and better leverage AI in daily operations.

- ***Louisiana Department of Education (EDLINK)***

Client: Louisiana Department of Education (EDLINK)	Contract Title: Development of a Statewide Birth-12th Grade Data System - EDLINK	Contract Duration: 2020 - Ongoing

Client Background: The Louisiana Department of Education (LDOE) embarked on a transformative journey to unify its early childhood systems and enhance kindergarten readiness. Recognizing the fragmented nature of existing programs, LDOE laid the foundation for a statewide early childhood network. This legislative move sought to amalgamate preschool, Head Start, and childcare programs, aiming to boost kindergarten preparedness for every child. The state's commitment to empowering families with choice and ensuring easy access to high-quality options underscored the initiative's objective: to set every child on a trajectory for success. In pursuit of this vision, LDOE initiated the EdLink project, a birth through 12th-grade data system designed to unify early childhood systems. Utilizing Agile software development methodologies, including Scrum and Kanban, the state aimed to facilitate seamless collaboration between various stakeholders and enhance the overall efficiency of the education system.

TSCTI, as a sole vendor design, develops, implements, and supports a birth through 12th-grade data system – EdLink. We manage and execute using Agile software development methodologies (Scrum, Kanban, etc.). We work directly with state-managed staff to provide mentoring and knowledge sharing, integrated as part of the agile development methodology, with staff to troubleshoot system issues, identify and implement defect fixes and system enhancements, support development, testing, build, and deployment tasks, provide post-implementation and helpdesk support, and performance of maintenance and upgrade activities.

Solution & Services Provided: TSCTI uses Agile approaches, notably Scrum and Kanban, to create a smooth process for application development and technical support. This method fosters a cohesive early childhood network. Aid in the development process, TSCTI employs innovative tools such as Jira for project management and version control, enabling collaboration and transparency among teammates. Jenkins efficiently manages continuous integration and deployment by establishing an automated build and deployment pipeline, hence increasing overall efficiency. In terms of development environments, TSCTI facilitates the transition from development to various testing phases, such as System Integration Testing (SIT), User Acceptance Testing (UAT), and Production, enabled by tools such as Docker for containerization and Kubernetes for orchestration. Code reviews, which are critical for preserving code quality, are conducted effortlessly utilizing collaborative tools connected with version control systems such as Git. TSCTI, as part of the Agile methodology, not only helps with testing phases but also guides state-managed resources through defect triage and resolution. This is accomplished with automated testing technologies like Selenium for web application testing and JUnit for Java-based testing.

Additionally, recognizing the importance of efficient communication and knowledge access, *TSCTI deployed an internal chatbot* for the EdLink project. This intelligent chatbot served as a virtual assistant, providing quick access to documentation, FAQs, and other relevant information. Team members could inquire about project details, coding standards, or any information related to the development process, enhancing overall productivity. The chatbot's integration with code analysis tools proved invaluable, offering developers quick suggestions, code examples, and troubleshooting tips. From coding queries to syntax errors and debugging assistance, the chatbot became an indispensable tool in the development toolkit. Key Features of the Chatbot:

- Knowledge Base Access: Instant access to documentation, FAQs, and project details.
- Code Analysis Tools Integration: Quick suggestions, code examples, and troubleshooting for developers.
- Task Automation: Streamlining repetitive tasks for increased efficiency.
- Project Management Integration: Seamlessly integrating with project planning tools for enhanced collaboration.
- Collaboration and Communication: Facilitating communication within the team.
- Feedback Collection: Gathering valuable feedback for continuous improvement.

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We ensured that all AI-related activities adhered to strict data privacy, security, and ethical standards. Our AI governance framework included thorough risk assessments to identify potential issues and opportunities, aligning with best practices and relevant standards such as ISO/IEC 27001 for information security management. Our policy implementation involved defining clear roles and responsibilities, establishing timelines, and integrating a monitoring and evaluation system to ensure continuous compliance and effectiveness. Additionally, TSCTI provided comprehensive training support for LDOE staff involved in the EdLink project. This training covered AI fundamentals, data analysis, machine learning basics, and the use of specific AI tools. We designed a flexible curriculum tailored to the diverse needs of the state's educational staff, ensuring they were well-equipped to leverage AI tools effectively. Training included hands-on experience with relevant platforms, fostering a data-driven culture, and enabling staff to identify opportunities for process improvement and innovation.

- ***Minnesota Department of Health***

Client: Minnesota Department of Health	**Contract Title:** 24x7 COVID-19 Contact Tracing and Vaccine Scheduling Call Center Services	**Contract Duration:** 02/2020 – 05/202

Client Background: The Minnesota Department of Health (MDH) is the state's lead public health agency, responsible for protecting, maintaining, and improving the health of all Minnesotans. During the COVID-19 pandemic, MDH was tasked with one of its most urgent and large-scale challenges: implementing statewide contact tracing, case investigation, and vaccine scheduling programs to mitigate the spread of the virus and ensure equitable vaccine distribution. The agency required a partner capable of rapidly deploying a secure, scalable, and compliant solution that could handle thousands of daily interactions while maintaining strict adherence to HIPAA and public health guidelines.

Solution & Services Provided: TSCTI was awarded a contract with the Minnesota Department of Health to provide 24/7 COVID-19 contact tracing and vaccine scheduling call center services. This project required not only operational excellence but also intelligent coordination across high volumes of sensitive health interactions. To meet this demand, TSCTI established a fully virtual contact tracing call center, supported by Salesforce and Twilio for workflow management, data collection, and call routing. Our team of trained case investigators and contact tracers worked under the supervision of epidemiology leads to conduct interviews with diagnosed individuals, identify exposed contacts, and document outcomes in a secure web-based data management platform. At peak operation, the call center managed a minimum of 1,000 calls per day, scheduling and rescheduling large volumes of vaccine appointments while ensuring compliance with HIPAA and state confidentiality requirements.

What makes this project particularly relevant to our AI Voice Agent solution is the way we structured operations to maximize efficiency and accuracy. In Minnesota, our supervisors and epidemiology lead relied heavily on structured workflows, scripted interviews, and dynamic task assignments to guide staff in real time. The same model can now be enhanced with our AI Voice Agent, which can serve as an internal "agent-assist" system—providing knowledge prompts, verifying eligibility criteria, summarizing calls, and routing interactions intelligently. By embedding AI directly into the call center workflow, customer care representatives will no longer rely solely on static scripts but will have real-time guidance, compliance checks, and automation at their fingertips.

- ***Illinois Secretary of State's Office (ILSOS)***

Client: Illinois Secretary of State's Office	**Contract Title: Call Center Services**	**Contract Duration:** 2023 - Ongoing

Client Background: The Illinois Secretary of State's Office (ILSOS) faced the challenge of efficiently managing a high volume of calls related to driver's licenses, vehicle registrations, and corporate filings. Recognizing the need for a robust call center solution, ILSOS partnered with TSCTI to enhance its customer service operations.

Solution & Services Provided: TSCTI, leveraging its expertise, implemented an AWS-based system called Calls.Care to revolutionize call center services for ILSOS. The system incorporated Interactive Voice Response (IVR) self-service, strategic call routing, and scripted responses to address various inquiries. A team of 35 call center agents was deployed to manage an average of 2,500 daily calls, covering a spectrum of services such as Driving Licenses, Vehicle Registrations, and Corporate Filings.

To further elevate productivity, TSCTI seamlessly integrated a chat solution within the Calls.Care framework, enhancing the Automated Call Distributor (ACD) capabilities. This innovative addition facilitated automated session routing, synchronizing seamlessly with call routing based on the skill sets of our dedicated call center agents. *Additionally, an internal chatbot was strategically deployed to serve the internal team by providing requested deliverables and streamlining communication processes.* This holistic approach not only optimized external customer interactions but also bolstered internal operational efficiency, showcasing TSCTI's commitment to a comprehensive and integrated solution.

Experienced and trained agents ensured a remarkable 95% Service Level Agreement (SLA) compliance, answering calls within 20 seconds and providing resolutions within 5 minutes. The Calls.Care platform enabled real-time monitoring of call quality, information accuracy, and overall performance metrics. Daily and weekly status reports, showcasing key metrics and achievements, were generated and shared with ILSOS management, fostering transparency and effective communication. The implementation of Calls.Care not only met but exceeded ILSOS's expectations, demonstrating a commitment to efficiency and customer-centric service. The 95% SLA compliance showcased quick

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response time, enhancing the overall caller experience. TSCTI's daily and weekly reports provided valuable insights, establishing the company as a reliable partner in supporting the critical functions of the ILSOS.

➢ ***Florida Department of Management Services***

Client: Department of Management Services, FL	**Contract Title: Managed Service Provider (MSP): Staffing Solutions**	**Contract Duration:** 2019 - Ongoing

Client Background: The State, in its pursuit of efficient staffing solutions, recognizes the need for a Managed Service Provider (MSP) to oversee the provision of temporary administrative, industrial, and medical staffing services. The State aims to enhance its staffing processes, ensuring agility and responsiveness to diverse staffing requirements across various departments. In Jun 2021, TSCTI was awarded this contract as a prime MSP vendor. Under this contract, TSCTI is utilizing its dependable and easily accessible Managed Service Provider Solution.

Solution & Services Provided: In providing Managed Service Provider (MSP) solutions for the State's temporary staffing needs, TSCTI deployed a robust Management System (MS). Delivered in a Software as a Service (SaaS) model, the MS is easily accessible via the internet, employing an extensive configuration tool for seamless updates. Streamlining approval and billing processes, TSCTI leverages pre-established routing, desktop action lists, and automatic approval backups. The MS also automates time and expense capture, reducing paperwork and offering statewide reporting for enhanced efficiency and accuracy. This system manages end-to-end processes, including procurement of Contingent Staff, assignment management, hours worked tracking, invoicing consolidation, and comprehensive reporting. Ensuring continuous access, the MS facilitates seamless operations with a 98% uptime target and proactive notification of planned or unplanned outages.

Additionally, we also integrated a chatbot, enhancing user experience and streamlining internal processes. This chatbot assists our account managers, SMEs, and Technical Recruiters in handling the substantial staffing requirements efficiently. It helps TSCTI with swift initial candidate screenings, matches candidates with suitable opportunities, provides essential information, assists in onboarding, and ensures stakeholders are informed through automated notifications. This integrated approach, combining a robust MS and an intelligent chatbot, not only optimizes staffing processes but also contributes to overall operational efficiency.

Strength and relevance of references and prior work

- ***Respondent shall also provide references, including a contact person, email, and phone number.***

Customer Name	US Office of Personnel Management
Contact POC	Desmond A. Solomon
Customer Address	1900 E Street, NW Washington, DC 20415-1000
Telephone Number	Desk: 202-987-3185 | Cell: 202-743-8142 | Help Desk: 202.606.4927 | Toll Free: 866.631.3019
Customer Email Address	desmond.solomon@opm.gov
Duration	2022 - Ongoing

Customer Name	Internal Revenue Service
Contact POC	Amy Stefenack
Customer Address	Building 1111 Constitution Ave., NW · Washington, D.C. 20224
Telephone Number	(215) 704-2696
Customer Email Address	Amy.Stefenack@irs.gov
Duration	2022 – Ongoing

Customer Name	Louisiana Department of Education (LDOE)
Contact POC	Chintan Shah
Customer Address	1201 N 3rd St, Baton Rouge, LA 70802, United States
Telephone Number	407-430-5965
Customer Email Address	Chintan.Shah@LA.GOV
Duration	2019 - Present

W-9 Form

- ***Respondent's W-9.***

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ Go to *www.irs.gov/FormW9* for instructions and the latest information.

Give Form to the requester. Do not send to the IRS.

Print or type. See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.
22nd Century Technologies, Inc.

2 Business name/disregarded entity name, if different from above
Same as above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☑ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):
Exempt payee code (if any) _____
Exemption from FATCA reporting code (if any) _____
(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.
8251 Greensboro Drive Suite 900

Requester's name and address (optional)

6 City, state, and ZIP code
McLean VA, 22102

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN,* later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number
[ ][ ][ ] – [ ][ ] – [ ][ ][ ][ ]

or

Employer identification number
2 2 – 3 5 0 2 1 2 1

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here Signature of U.S. person ▶ Date ▶ 9/16/2025

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9.*

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

Cat. No. 10231X Form **W-9** (Rev. 10-2018)

Authorized Application Signature and Acceptance Form (Attachment B)

- ***Authorized Application Signature and Acceptance Form (Attachment B).***

Massachusetts Technology Collaborative RFP No. 2026-JAII-01

Attachment B

Massachusetts Technology Collaborative
Authorized Respondent's Signature and Acceptance Form

The undersigned is a duly authorized representative of the Respondent listed below. The Respondent has read and understands the RFP requirements. The Respondent acknowledges that all of the terms and conditions of the RFP are mandatory, and that Respondent's response is compliant with such requirements.

The Respondent understands that, if selected by the Mass Tech Collaborative, the Respondent and the Mass Tech Collaborative will execute an Agreement specifying the mutual requirements of participation.

Respondent agrees that the entire bid response will remain valid for sixty (60) days from receipt by the Mass Tech Collaborative.

I certify that Respondent is in compliance with all corporate filing requirements and State tax laws.

I certify that the statements made in this response to the RFP, including all attachments and exhibits, are true and correct to the best of my knowledge.

I acknowledge and understand the procedures for handling confidential materials submitted to the Mass Tech Collaborative as set forth in Section 3.1(d); I agree to be bound by those procedures and agree that the Mass Tech Collaborative shall not be liable under any circumstances for the disclosure of any materials submitted to the Mass Tech Collaborative pursuant to this RFP or upon the Respondent's selection.

Respondent: 22nd Century Technologies, Inc.
(Printed Name of Respondent)

By: Ashley de Sa
(Signature of Authorized Representative)

Name: Ashley Christina De Sa
Title: Administrator
Date: 9/16/2025

Note: We acknowledge receipt of Amendment 01

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Headquarters: 8251 Greensboro Drive, Suite 900, Mclean, VA, 22102

Massachusetts Technology Collaborative

Grant Agreement
Standard Budget and Invoice Template
Invoiced Costs

Line Number																			
1	**Budgeting**																		
2	Applicant Information																		
3	Applicant: 22nd Century Technologies, Inc.				Procurement No.: RFP No. 2026-JAII-01														
4	Budget Period: 1 Year (TBD)				Title of Proposed Project:														
5	Address: 8251 Greensboro Drive, Suite 900, McLean, VA 22102				Request for Proposals for AI Hub Data Commons Collaborative Consulting Services														
6																			
7																			
8					MTC Funding Requested:														
9					Total Project Cost: $2,089,633														
10	Cost Elements				Total Project	Invoice 1		Invoice 2		Invoice 3		Invoice 4		Cumulative					
11						Period: MM/DD/YYYY-MM/DD/YYYY		Period: MM/DD/YYYY-MM/DD/YYYY		Period: MM/DD/YYYY-MM/DD/YYYY		Period: MM/DD/YYYY-MM/DD/YYYY		Period: MM/DD/YYYY-MM/DD/YYYY					
12							Amount		Amount		Amount		Amount	Expended		Remaining			
13	I. Direct Labor																		
14	*name/title*	*HRS*		*Rate*		*HRS*		*HRS*		*HRS*		*HRS*							
15	Program Manager	960		$125	$120,000		$ -		$ -		$ -		$ -	$ -		$ 120,000.00			
	Solution Architect	960		$133	$127,680														
	Data Governance Lead	480		$133	$63,840														
	Cloud Engineer	1440		$105	$151,200														
	Platform Engineer	2400		$105	$252,000														
	Data Engineer	2400		$105	$252,000														
	ML Engineer	1800		$105	$189,000														
16	ML/AI Fairness SME	800		$105	$84,000		$ -		$ -		$ -		$ -	$ -		$ 84,000.00			
17	QA Lead	640		$78	$49,920		$ -		$ -		$ -		$ -	$ -		$ 49,920.00			
18	Security Engineer	480		$86	$41,280		$ -		$ -		$ -		$ -	$ -		$ 41,280.00			
19	Trainer/Technical Writer	320		$75	$24,000		$ -		$ -		$ -		$ -	$ -		$ 24,000.00			
20	Business Analyst	960		$75	$72,000		$ -		$ -		$ -		$ -	$ -		$ 72,000.00			
21	Total Direct Labor				$1,426,920	0	$ -	0	$ -	0	$ -	0	$ -	$ -		$ 391,200.00			
22																			
23	II. Direct Labor Fringe Cost	Rate (%):		28%	$399,538		$ -		$ -		$ -		$ -	$ -		$ 399,537.60			
24																			
25	II. Subcontractors/Consultants/Contracted Staffing																		
26	*Firm name/title or role/type of services to be provided*	*HRS*		*Rate*		*HRS*		*HRS*		*HRS*		*HRS*							
27					$0		$ -		$ -		$ -		$ -	$ -		$ -			
28					$0		$ -		$ -		$ -		$ -	$ -		$ -			
29					$0		$ -		$ -		$ -		$ -	$ -		$ -			
30					$0		$ -		$ -		$ -		$ -	$ -		$ -			
31					$0	5	$ -		$ -		$ -		$ -	$ -		$ -			
32					$0		$ -		$ -		$ -		$ -	$ -		$ -			
33	Total Subcontractors/Consultants				$0	5	$ -	0	$ -	0	$ -	0	$ -	$ -		$ -			
34																			
35	III. Direct Materials (provide description and costs basis)																		
36	Curriculum Development & Training				$0									$0		$0			
37					$0									$0		$0			
38					$0									$0		$0			
39					$0									$0		$0			
40					$0									$0		$0			
41					$0									$0		$0			
42					$0									$0		$0			
43	Total Direct Materials				$0		$0		$0		$0		$0	$0		$0			
44																			
45	IV. Travel													$0		$0			
46																			
47	V. Other Direct Costs *(list type and description such as venue rental costs and cost basis)*																		
48	cloud				$30,000									$ -		$ 30,000.00			
49	initial model & validation				$5,500									$ -		$ 5,500.00			
50	SIEM integration				$3,500									$ -		$ 3,500.00			
51	Misc				$5,000									$ -		$ 5,000.00			
52					$0									$ -		$ -			
53	Total Other Direct Costs				$44,000		$ -		$ -		$ -		$ -	$ -		$ 44,000.00			
54																			
55	VI. General & Administrative Expense/Overhead	Rate (%):		12%	$219,175		$ -		$0		$0		$0	$ -		$219,175			
56																			
57	**Total PROJECT COSTS**				**$2,089,633**		**$0**		**$0**		**$0**		**$0**	**$0**		**$1,053,913**			

LEGEND:
Formula cell
Data entry cell

This section is for post-contract invoicing only. Do not complete with proposal.